American Journal of Public Health
and THE NATION'S HEALTH

Volume 35 August, 1945 Number 8

Tuberculosis Mortality in England and Certain Other Countries During the Present War*

JAMES A. DOULL, M.D., F.A.P.H.A.

Professor of Hygiene and Public Health, Western Reserve University, Cleveland, Ohio

BOMBS and shells have brought injury or death to untold thousands of civilians in enemy occupied Europe. The tragedy of this situation has obscured less immediate but not less destructive effects of the war on the lives of these unfortunate people. Over many decades, and to varying degrees, they had built up their defenses against infectious diseases. They had shelter, food, hospitals, medical and health services. For many, these defenses were completely removed. They were forcibly removed from their homes, herded into ghettos or concentration camps, starved or beaten to death. For others, technically described as "displaced persons," and estimated to number twenty to thirty millions, the extent of deprivation has varied, but, in general, it has resulted in overcrowding, dietary deficiencies, and long hours of labor. For those permitted to remain in their homes, there has been great variation in extent of privation but there has been a quite general shortage of essential foods, especially oils and fats. Malnutrition is widespread in Poland and Greece, and is undoubtedly very prevalent in all large cities of enemy occupied countries.

The effect of such an intensification of deleterious influences upon morbidity and mortality from tuberculosis will never be told to the satisfaction of the vital statistician. Dislocations of populations have been too great. Little credence, moreover, can be given to statistics released by the Nazis. The following extracts[1] from reports given at the Royal Society of Medicine in London in December, 1943, need no comment except to state that whether or not they are overdrawn, they give no satisfaction to the statistician.

"At the Royal Society of Medicine a discussion took place on nutrition in enemy occupied Europe. An appalling picture was presented. Colonel E. W. Vignal said that

* Presented at a Joint Session of the Health Officers, Vital Statistics, and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

the daily ration in France yielded only 1,084 calories and was deficient in fat, protein, and sugar. Tuberculosis was increasing alarmingly and the Germans were enforcing silence about it. They had returned to France many tuberculous prisoners, most of them urgently needing treatment."

"Dr. H. P. Cawadias described famine conditions in Greece. Well-to-do people in Athens had one ounce of bread on alternate days, camomile tea, and gruel, with oil, carrots, and chicory coffee. Sausages of dog, rat, and cat were sold at outrageous prices. The mortality was terrible; they had ceased to bother about tuberculosis."

"Professor J. Young quoted a paper by Professor Heymans of Ghent, who had been punished severely by the Nazis for publishing it. The daily basic ration was only 1,230 calories. Certain classes were allowed supplementary rations but, although rations were adequate for the younger children, they were worse as age advanced. Tuberculosis was rife and was increasing."

GREAT BRITAIN

For reliable statistics we must turn to Great Britain. Mortality figures are available for England and Wales, and for Scotland, for each of the war years to the end of 1943. The Committee on Tuberculosis in Wartime[2] has published tabulations for respiratory and other forms of tuberculosis, by sex and certain age groups, to the end of 1941. For provisional data for 1943, and for a special tabulation of the deaths from tuberculosis of the central nervous system in England and Wales by age groups, for the years 1938–1943, inclusive, the writer is indebted to Dr. Norman F. Smith and to Dr. Melville MacKenzie, both of the Ministry of Health of Great Britain.

According to pre-war figures, in England and Wales, 98 to 99 per cent of all cases of pulmonary tuberculosis and about 70 per cent of all non-pulmonary tuberculosis were due to the human type of bacillus. In Scotland the proportion of bovine infections was higher and it is stated that about 5 per cent of cases of pulmonary tuberculosis were caused by the bovine type.[2]

Tuberculosis is still widespread among cattle in Great Britain,[2] the infection rate before the war being about 40 per cent. About 6 per cent of all farms were sending out milk containing tubercle bacilli and it was inferred that practically all bulked milk containing the mixed milk from twenty or more herds must contain the bacilli. In 1939, only about 3 per cent of the dairy farmers had had their herds tested. In London, 93 per cent of the milk is pasteurized; in the small towns only a small proportion, and in rural districts, practically none. One unavoidable result of the wartime evacuation policy was that it transferred large numbers of children from London and other large towns, where a considerable amount of the milk is pasteurized, to districts where practically all milk is supplied raw.

In the decade preceding the outbreak of war, mortality from all forms of tuberculosis in England and Wales had fallen by about one-third, from 91 per 100,000 in 1928, to 60 per 100,000 in 1938. In Scotland also, tuberculosis mortality had displayed a similar downward trend. Not only was the outbreak of war followed by arrest of these favorable trends but there occurred in England and Wales, and in Scotland, a definite increase in the number of deaths from tuberculosis. This is all the more significant because, as pointed out by Heaf and Rusby,[3] there was no increase in the death rate from all causes.

The ratio of the deaths in subsequent years to those in 1938 is shown for males and for females of each area in Table 1. In England and Wales a rise in the number of deaths occurred in both respiratory and non-respiratory tuberculosis, the latter increasing somewhat more than the pulmonary form. The increase in pulmonary tuberculosis affected males (12 per cent) slightly more than females (10 per

TABLE 1

*Deaths from Tuberculosis in England and Wales, and Scotland, by Sex and Form Actual Deaths for 1938, and Ratio (Per cent) of Deaths in Each Subsequent Year to Those in 1938**

	Respiratory				*Other Forms*			
	Males		*Females*		*Males*		*Females*	
Year	*E. & W.*	*Scot.*	*E. & W.*	*Scot.*	*E. & W.*	*Scot.*	*E. & W.*	*Scot.*
1938	12,445	1,396	8,837	1,185	2,261	435	1,996	416
1939	102	108	100	102	99	94	93	96
1940	112	120	110	115	105	112	105	115
1941	112	118	109	124	117	119	119	130
1942	101	112	96	125	107	109	107	116
1943	105	113	94	118	98	109	105	123

* Figures for 1943 are provisional. Deaths among non-civilians are included.

cent); while the increase in other forms of the disease affected females (19 per cent) somewhat more than males (17 per cent). Reaching a peak in 1940 or 1941, the number of deaths reached approximately the 1938 level in 1943. Female mortality from pulmonary tuberculosis was, under the circumstances, very favorable in 1943, being more than 6 per cent below that for 1938, while for other forms of tuberculosis female mortality in 1943 was still 5 per cent above the 1938 level. Male mortality, on the other hand, showed just the reverse picture; for the pulmonary form it was 5 per cent higher in 1943 than in 1938, and for the non-pulmonary forms, 6 per cent lower.

In Scotland, the increases were relatively greater than in England and Wales for both respiratory and non-respiratory forms. Females were affected substantially more than males. Furthermore, the decline in Scotland since the peak year has been unsatisfactory. The number of deaths from all forms of tuberculosis was 15 per cent higher in 1943 than in 1938.

Age incidence—In England and Wales, the increase in deaths from pulmonary tuberculosis in 1940 and 1941 affected mainly children, younger women, and older men. For other forms of tuberculosis, the percentage increase was greatest in children, adolescents, and young adults of both sexes. In Scotland, much the same age groups were affected by the increases but they were proportionately greater than in England and Wales, particularly in young adults (15–24 years).

Tuberculosis meningitis—The chief feature of non-respiratory tuberculosis during the present war has been the increased frequency of tuberculous meningitis. For England and Wales, the number of deaths from tuberculous meningitis in 1941 exceeded the average for the years 1938 and 1939 by 34 per cent in males, and by 38 per cent in females. For Scotland the comparable increases were 37 per cent in males, and 60 per cent in females.

In Table 2, the average numbers of deaths from tuberculosis of the central nervous system in England and Wales for 1938 and 1939 are shown by age groups, with the percentage increases or decreases in subsequent years. All age groups were adversely affected, but especially persons under 35 years of age. In the younger ages, improvement occurred after 1941, but this is not evident among those over 15 years of age.

No studies on the type of tubercle bacillus present in these cases have come to the writer's attention and it is improbable that extensive investigations have been made. Probably the bovine bacillus has played a larger rôle than

TABLE 2

Deaths from Tuberculosis of the Central Nervous System in England and Wales, by Age Groups: Average Number of Deaths in 1938 and 1939, with Ratio (Per cent) of Deaths in Each Subsequent Year to this Average*

	Age Groups in Years			
Year	*0–4*	*5–14*	*10–34*	*35 and Over*
Average 1938–39	794	435	380	103
1940	105	105	124	110
1941	138	137	140	120
1942	110	112	136	114
1943	104	109	137	125

* Deaths of non-civilians are included.

before the war, but it is noted in the Report of the Committee,[2] from which much of this material is taken, that there was a considerable increase in respiratory tuberculosis among children, caused chiefly by the human type and that there was a considerable increase in tuberculous meningitis among children in London where the bulk of the milk is pasteurized.

The years 1940 to 1943 were marked also by large increases in meningococcal meningitis. It seems improbable, however, that error in diagnosis could have played any substantial part in the recorded increases in deaths from tuberculosis of the central nervous system.

In an interesting study of tuberculosis in the war years in Glasgow, Laidlaw and MacFarlane[4] reported, in 1941, the results of their investigations of the occupations of persons suffering from tuberculosis. The figures show little increase among commercial and professional classes whose hours of work had not been greatly increased, and that the heavy incidence fell upon the workers in heavy industries, and to a less extent on workers in medium heavy industries. The standard of overtime accepted by the authors is that the weekly hours of labor should not exceed 60 hours for men and 55 hours for women. For the commercial class it is stated that only 20 per cent were working in excess of the standard, as compared with 67 per cent in heavy industries and over 40 per cent in the medium heavy industries.

The Committee[2] has also compared the environmental changes of the First World war with those of the present war:

> "The chief environmental changes that are peculiar to this war are: (1) the evacuation of many tuberculosis hospitals and sanatoria in September, 1939, to make room for expected air raid casualties, with the consequent return to their homes of numerous patients in an infective state; (2) the institution of blackout conditions, which, by diminishing ventilation, increase cross-infection and possibly lower general resistance; (3) overcrowding in the homes, due to destruction of residential property by enemy action and the added effect of billeting; (4) evacuation of the population, which may have led to billeting in homes containing infective tuberculous persons, and, conversely, to the introduction of tuberculous persons into healthy homes; (5) evacuation of town populations to the country, with the result that many children previously supplied with pasteurized milk have had to change over to a raw milk supply. The first four factors would favour pulmonary infection with the human type; the fifth, non-pulmonary infection with the bovine type."

Certain environmental changes are common to both wars. Chief among these is the great increase in industrialization. Owing to the demand for labor, persons suffering from active tuberculosis have been employed with resultant exposure of fellow-workers. Large numbers of persons who had lived a relatively isolated existence have entered factories for the first time. The general resistance of laborers may have

been lowered by long hours of labor, fatigue being increased by duty as home guards, fire-watchers, or other civil defense occupations.

Comparison is made also in the report [2] of the course of mortality in England and Wales in the First and Second World Wars. The increase in tuberculosis deaths from 1914 to 1916 was 5 per cent for males and 7 per cent for females, as compared to 11 per cent for males and 13 per cent for females from 1939 to 1941. In the First World War the increase was largely in middle childhood and early adult life; in the present war it has extended into early childhood and later adult life. There is a striking contrast between the large increase in deaths in children under 5 years of age in the present war and the slight decline in tuberculosis deaths in this age group between 1914 and 1916.

Reports from Germany indicate that mortality from tuberculosis increased following the outbreak of war. In the Berlin area, a rise in the number of deaths from acute forms has been reported, especially in the age group 30–35 years. The writer has not found any reports from Italy. If the experience of the last war is repeated, tuberculosis will be more serious in enemy countries after collapse than during the war.

The data which have been available to the writer concerning Spain, Switzerland, and Sweden have been too limited to justify discussion.

DISCUSSION

As a consequence of the war, there has occurred in Great Britain not only an arrest of the downward trend of tuberculosis but a considerable increase over pre-war levels in mortality from the disease. There have probably been far greater increases in certain enemy occupied countries.

The experience of Great Britain indicates that increased exposure to infection has been a major factor. In support of this view the rise in tuberculous meningitis is especially significant. The London experience suggests that the human type of tubercle bacillus has been chiefly responsible, although probably the bovine type has played a rôle considerably more important than in pre-war days.

Greater exposure would account also for some of the increase in mortality from pulmonary tuberculosis. Massive dosage in children may result in an acute and fatal primary pulmonary process; and, in older persons who have recovered from a childhood infection, acute pulmonary tuberculosis of the reinfection type may be a sequel to such dosage.

A simpler explanation of much of the increase in adults is that it may have been the result of an acceleration of mortality rather than of a real increase in morbidity. Many patients returned to their homes from sanatoria and some of these, as well as others with active disease, desiring to aid the prosecution of the war, concealed their illness and entered industry.

Any discussion of possible lowering of resistance can be little more than speculative. If it be granted that dormant or healed tuberculosis can be stirred into activity by fatigue, then this factor should have serious consideration. Rather superficial observation leads the writer to the conclusion that malnutrition has probably not been a major factor. Very great attention has been paid to the dietary in Great Britain and especially to the importance of protective foods.

REFERENCES

1. Foreign letters. Nutrition in Enemy Occupied Europe. *J.A.M.A.*, 124:251 (Jan. 22), 1944.

2. *Report of the Committee on Tuberculosis in Wartime.* Medical Research Council Great Britain. London: His Majesty's Stationery Office, 1942.

3. Heaf, F., and Rusby, L. A Further Review of Tuberculosis in Wartime. *Tubercle*, 23:107 (May), 1942.

4. Laidlaw, S., and MacFarlane, D. Factors Influencing the Increased Incidence of Pulmonary Tuberculosis in Glasgow. *Brit. M. J.*, 2:65 (July 18), 1942.

Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization*

EDWARD BIGG, M.D., B. H. JENNINGS, M.E., AND F. C. W. OLSON †

Associate in Medicine, Northwestern University Medical School; Professor and Chairman, Department of Mechanical Engineering, Northwestern Technological Institute; and Research Associate, Northwestern Technological Institute, Evanston, Ill.

THE clearly established bactericidal and viricidal effect of glycol vapors on air-suspended microörganisms has presented a new means for attack on the problem of control of air-borne infection. Following intensive laboratory studies on the fundamental aspects of this problem, which have been well summarized in a recent publication,[1] certain practical studies were necessary before full scale clinical application could be attempted. These included investigation of possible fire hazards in the use of these compounds,[2] observations on the properties of glycol vapors in large spaces, and the development of apparatus for generation and distribution of the vapor.[3, 4, 5]

The encouraging outcome of these studies led to a large scale field trial to determine if the incidence of air-borne infections can be reduced by treating living quarters with triethylene glycol (TEG) vapor in effective concentrations.‡ Triethylene glycol was used in this study since it is effective in much lower concentrations than propylene glycol and has been shown to be similarly non-toxic in the recommended concentrations.

MATERIALS

Location of Study—Two two-story barracks, each consisting of two wings, were selected for study. These buildings were divided into eight dormitories, each 120 x 30 x 9 ft; each dormitory housed approximately 80 men in 40 double bunks about 1½ ft. apart. It was decided to use four of the dormitories for test, and four for control purposes. The east wing of one building and the west wing of the other (four dormitories) were used as tests; the remaining four dormitories served as controls. We started with 320 test individuals and 320 controls, which were replaced by a new group of men at 6 week intervals. We were able to observe three such groups, or a total of 1,000 men in the test group and 1,000 in the controls. This number is approximate since some men were transferred and exchanged during our ob-

* Presented at a Joint Session of the Epidemiology, Health Officers, Laboratory, and School Health Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944. The work described in this paper was done under contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Northwestern University.

† With the technical assistance of Margaret Mellody and Silva Trautman.

‡ The engineering aspects of this test have been described in detail elsewhere.[6]

servation periods. An intermingling of personnel occurred during the day in mess halls, classrooms, drill halls, recreation halls, etc., but since we believed that the greatest incidence of cross-infections and the greatest degree of air contamination occurs in sleeping quarters, it was felt that significant results could be obtained by treating only those quarters.

The problem of maintaining comfortable room temperature was difficult. A single outside thermostat controlled the heat input of each building (two test and two control dormitories) with no available means for the closure of individual steam radiators. Thus, with closed windows and doors in test dormitories, it was necessary to bring in large quantities of fresh cold outside air through the duct system described below, to keep the test room temperatures within comfortable limits. Despite this measure there were occasional uncomfortable rises in temperature, necessitating the opening of windows, with a resultant lowering of glycol concentrations. Temperature adjustment of the control dormitories was left to the discretion of the occupants.

Since it has been shown that dust is of importance in air contamination, and since sleeping quarters are notoriously high in dust content due to bedclothes, etc., it was decided to effect a simple dust control measure by treating the floors in both test and control dormitories with a light floor oil.

Triethylene Glycol (TEG) — The chemical, physical, and pharmacological properties of triethylene glycol have previously been described.[1] In brief, it can be stated that the vapor is effective in low concentrations, it is nontoxic and non-inflammable in these concentrations, the cost is nominal, and no odor is perceptable. A relative humidity of 25 to 60 per cent is desirable for optimum bactericidal action, but killing of air-suspended microörganisms occurs in a humidity range of 20 to 80 per cent. A special "air sterilization grade" of triethylene glycol was supplied by the Carbide and Carbon Chemicals Corporation. This material is highly refined and free from the impurities commonly present in the glycol purchased on the open market.

Vaporizer—A great deal of effort and time was expended in the development of a method of glycol generation which would introduce glycol-vapor at a predetermined controllable rate.

Glycol-vapor was generated by vaporization from an aqueous glycol solution. Since this is a miscible binary mixture, the temperature at which boiling takes place varies with the concentration of the particular mixture. When a glycol-water solution is heated, water, being the more volatile component, vaporizes more readily; however, both water and glycol vapors are delivered from the boiling mixture. The more rapid loss of water results in a solution richer in glycol and raises the boiling point of the mixture. It can be seen that if the relative proportions of the boiling glycol and water are kept constant, the respective proportion of glycol- and water-vapor emitted from the vaporizer will remain constant and the total output of vapor will depend on the heat input or rate of boiling.

This vaporizer aids in maintaining desired humidities as well as obtaining effective glycol concentrations, and is described in detail in a previous publication.[4]

Duct and Fan System—The size and shape of the dormitories, and a double row of lockers extending the length of the room necessitated the construction of a duct system to distribute glycol and water-vapor uniformly throughout the space.

Figure 1 shows the general arrangement of the equipment. For clarity the lockers and two nearby bunks are not shown. At the far left is the fresh air

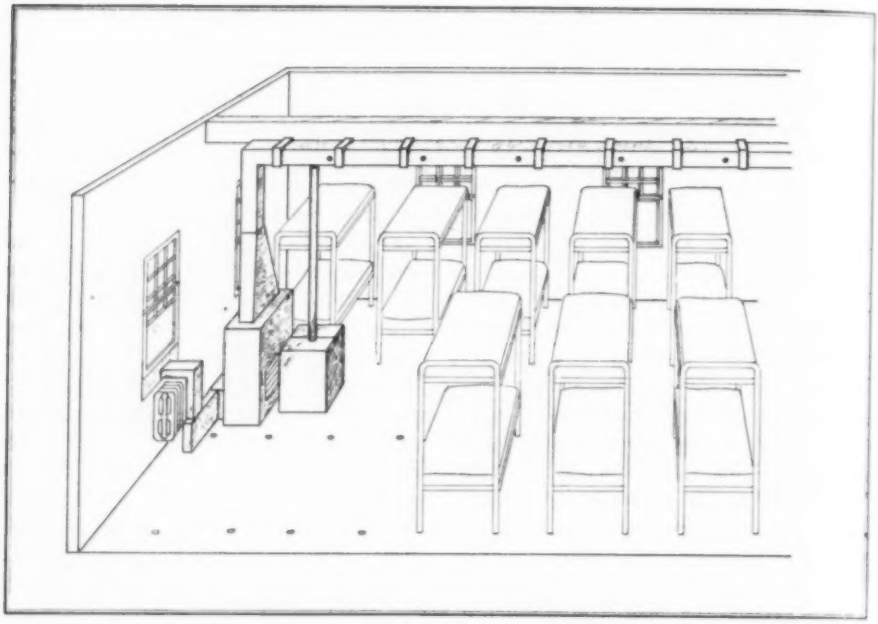


FIGURE 1—Diagrammatic representation of duct, fan unit, and vaporizer as installed in dormitory

intake coming from a special fitting in the window. The fresh air enters the back of the blower fan unit through a set of dampers. Recirculated room air enters the front of the fan unit through the louvres (visible in the drawing) and another set of dampers. Both sets of dampers may be controlled by a lever mounted on the top of the fan cabinet. Thus the air output can be varied uniformly from 100 per cent fresh air to 100 per cent recirculated air. The fan output may be varied in six steps to produce from 750 to 1,700 cu. ft. per minute at free delivery of the fan. The air is blown from the fan into the pyramid shaped adapter piece, and then enters the duct through a right-angled elbow provided with turning vanes. The duct is of laminated asbestos construction, specially treated to resist the absorption of glycol.* The air leaves the duct through circular openings $2^{3}/_{32}$ in. in diameter, spaced 5 ft. apart, on each side of the duct. The vaporizer is mounted on the floor in front of the fan unit and delivers the glycol-water vapor through a well insulated $1\frac{1}{4}$ in. pipe to the distributing duct.

Sampling Tables—To facilitate the taking of glycol and bacterial samples in the crowded dormitories, special sampling tables were built (Figure 2). These were sturdily constructed of $\frac{3}{4}$ in. pipe and pipe fittings. Rubber-tired wheels are fitted to the front legs and pipe caps to the rear legs. A motor vacuum pump unit provided with an extension cord is mounted on the horizontal braces by pipe straps forming, in effect, a vibration-free, three-point suspension. On the front end of the table top is fastened a rack for holding test tubes for glycol samples and "Moulton air samplers" for bacterial samples. The rack proved not

* This material was supplied by the Philip Carey Mfg. Co., Lockland, Ohio.

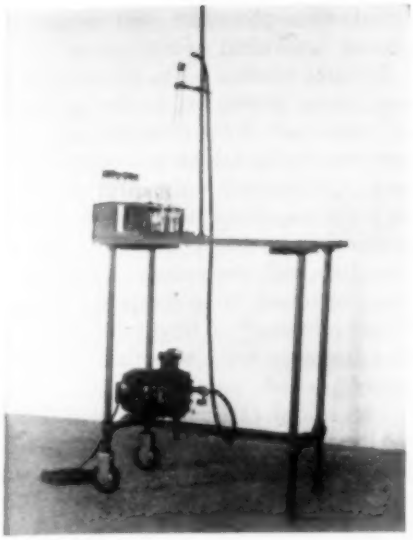


FIGURE 2—Table used for obtaining glycol and bacterial samples

only convenient but it also reduced breakage. A ¼ in. pipe in a floor flange bolted to the table top serves as a ring-stand for holding test tubes and air samplers while samples are being taken. There is ample space on the table for writing purposes. These tables made it possible to take air samples in all parts of the dormitories and at any desired height.

Operation of Equipment—Following the installation described above measurements were made to obtain the relative air velocities through the various outlets of the duct, and air samples were also taken at the openings for glycol determinations. The results showed remarkably uniform distribution of air and glycol, and demonstrated that complete mixture of glycol and air had occurred before the first opening was reached, and that there was no perceptible loss of glycol as the air flowed through the duct.

For adequate ventilation it was decided to allow not less than 25 cu. ft. per minute of outside air per individual. Since it was estimated that the uncontrolled normal infiltration of air was equivalent to two air changes per hour, the fan speed was set to deliver from 1,000 to 1,200 cu. ft. per minute of outside air. Even in well constructed buildings there is a considerable amount of infiltration and exfiltration which cannot be determined accurately; it depends not only on the general tightness of construction, particularly around windows and doors, but also on wind velocity and direction. To reduce this inaccuracy to a minimum it is essential to keep all doors and windows closed and to depend on bringing in fresh air by means of the fan alone. Therefore, every effort was made to keep the doors and windows of the treated rooms closed. All air entering the duct was "glycolized." Ventilation in the control room was at the discretion of the occupants; it is believed that the number of air exchanges was greater than in the test quarters. Since the volume of the room was 33,000 cu. ft., with the equivalent of four air changes per hour, it was calculated that a glycol delivery of 0.04 lb. per hour would be needed to maintain a concentration of approximately 0.004 mg. TEG per liter of air. To obtain this output the operating vaporizer temperature was set at 280° F., using a 1,000 watt heater. This setting gave a concomitant water delivery of 2.5 lb. per hour.

METHODS

Glycol Determinations—Since preliminary observations showed uniform distribution of glycol throughout the treated space it was decided to take all air samples for glycol analysis at one fixed location in each test room. Air samples were taken at 2:00 A.M., 5:00 A.M., and 8:00 A.M. daily. These hours were chosen to coincide with the times at which air samples for determination of bacterial content were taken. Four cu. ft. of air were collected and analyzed for glycol content by a modification of

the technique described by Wise, *et al.*[7] The results were recorded as mg. TEG per liter of air.

Bacterial Determinations — Samples were taken in all the dormitories at the hours noted above. Since it is well known that movement of individuals within a space produces a sharp rise in the number of air-borne bacteria, we attempted to determine the air contamination at the highest and lowest point of room activity. At 2:00 A.M. the men were asleep, at 5:00 A.M. (Reveille) activity was greatest, and 8:00 A.M. the men had left their quarters.

Using a Moulton bacterial sampler, 10 cu. ft. of air were collected at the same position as used for glycol samples. Pour plates were made with 1 ml. of the sample, using blood agar media, and colony counts were recorded as colonies per cu. ft. of air, noting the number of colonies of hemolytic streptococci. Aliquots were also plated in media to which gentian violet (1–500,000) had been added.[8] The latter procedure was used to enable us to determine the presence of hemolytic streptococci more readily, but was not entirely satisfactory and was discontinued.

Temperature and Humidity—These observations were also made at 2:00 A.M., 5:00 A.M., and 8:00 A.M. Individual records were kept for each dormitory, including both test and controls. A sling psychrometer was used and wet and dry bulb readings were recorded. Records on outside weather conditions were also kept.

Throat Cultures—At the beginning of each observation period throat cultures were taken of each individual, both in the test and control groups. Swabs of the throat were placed in tubes containing 1 ml. of tryptose-phosphate broth (for convenience in carrying) and subsequently plated on blood agar. At the end of the 6 week period this procedure was repeated. Careful individual records were kept.

Diseases Studied—The following diseases were considered to be air-borne and were used in the compilation of our statistics: catarrhal fever, common cold, measles, German measles, mumps, scarlet fever, rheumatic fever, acute tonsillitis, otitis media, chicken pox, acute sinusitis, and pneumonia. Our data were obtained from outpatient diagnoses preliminary to hospitalization, and the diagnosis used was that of these records.

The record of each individual under observation in this study thus consisted of (1) throat culture at beginning and end of test period; (2) hospitalization with diagnosis, (3) outpatient visits with diagnosis; and (4) dormitory and bunk location.

DATA

Glycol Concentrations — Although it has been shown that for immediate killing of air-suspended organisms a concentration of 0.005 mg. TEG per liter of air is desirable, it was our belief that sufficient bactericidal and viricidal effect would be produced by the use of a somewhat lower concentration. We further realized the difficulties inherent in the enforcement of the rule for closed windows and doors at all times. Thus fluctuations in concentration may have occurred at times other than those at which analyses were taken.

The results of our analyses were quite constant. Although we occasionally obtained values as high as 0.010 and as low as 0.001 mg. TEG per liter, for the most part the concentration was between 0.0025 and 0.003. At no time was there any fog formation. It is interesting to note that we obtained a small but significant correlation between wind velocity and glycol concentration.

Frequent interrogation of the men concerning possible effects of the vapor elicited no evidence of irritation of the respiratory tract.

Temperature and Humidity—The room temperatures both in test and control dormitories were higher than desirable, averaging 72° F. in the control spaces and 75° F. in the test. The relative humidities recorded in the test and control dormitories showed an average approximately 5 per cent higher in the former. We were able to maintain the relative humidity within the optimum range for bactericidal glycol activity.

Bacterial Counts — Many workers have noted the extreme fluctuations of air bacterial content occurring in occupied spaces. We also observed this phenomenon. The most important factor influencing the variation in number of air-suspended organisms is the amount of movement in the room. We found that in the samples taken at 2:00 A.M. bacterial counts were relatively low as compared with the number of recoverable bacteria at the time of Reveille.

The overall reduction due to the action of glycol is shown in Figure 3. Each point of the curves represents a logarithmic average of the twelve readings obtained from four dormitories at three different times during the day. Large fluctuations have been reduced by 3-point moving averages.[9]

The occurrence of hemolytic streptococci in the controls was extremely sporadic. Many days often passed without their appearance, but isolated samples frequently contained hundreds of colonies. A great reduction of hemolytic streptococci in the test spaces was observed.

Incidence of Infection—For approximately the first half of each observation period, there was little difference in hospital admission rate between control and test. Following this inconclusive phase, however, a definite effect was noted. For the first entire 6 week period there were 63 admissions from the control group and 56 from the test,

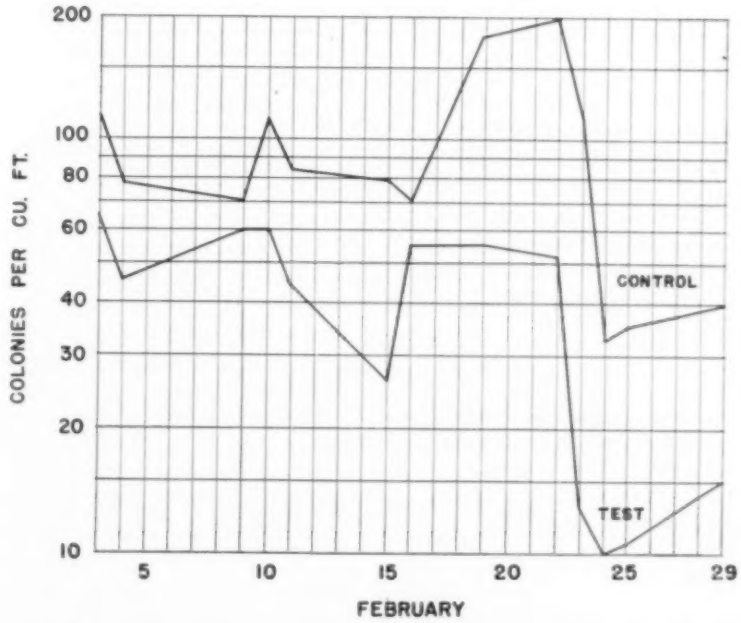


FIGURE 3—Daily bacterial counts in test and control dormitories, showing reduction obtained in glycol-treated spaces

representing a reduction of 11 per cent. During the last 17 days, there were 19 admissions from the control and 7 from the test, or a reduction of 63 per cent.

Data from the second 6 week observation period showed comparable values, i.e., 63 from the control and 55 from the test (13 per cent reduction). The last 17 days showed 34 cases as compared with 12 (65 per cent reduction).

The third observation period produced inconclusive data. This was due to the fact that conditions produced by high outside temperatures and unsatisfactory overheating of the sleeping quarters during the last 3 weeks of the test resulted in opening of windows, effecting a lowering of the glycol concentration. Combining the first two periods, we find a total of 126 hospital admissions from the control dormitories and 111 from the test quarters, or a reduction of 12 per cent. For the final 17 days of both periods, there are 53 from the control as compared to 19 from the test, representing a reduction of 64 per cent.

Table 1 records our experience in a study of a small epidemic of mumps. For the first 3 weeks (the recognized incubation period of this disease) there was a fairly comparable rate of admissions from both the test and controls. Thereafter there were only 4 additional cases from the test barracks while 14 cases occurred in the control dormitories.

TABLE 1

Record of Hospitalizations for Mumps, Showing Effect of Glycol Following Mumps Incubation Period

	Test	*Control*
Total Number of Hospitalizations in 24 day period	9	9
Total Number of Hospitalizations for succeeding 17 days	4	14

There was no apparent correlation between total incidence of infection and outside weather conditions.

Throat Cultures—The results of these observations were most striking. A surprising number of individuals were found to harbor hemolytic streptococci in their throats. The average incidence in incoming men was 24 per cent. This figure represents the average percentage found in a total of approximately 2,000 men (three test periods).

A sharp reduction occurred in individuals exposed to the action of glycol vapors in their sleeping quarters. This is shown in Table 2 which represents the percentage of positive throat cultures in test and control men. The original incidence of 34.2 per cent in this test group fell to 8 per cent at the end of the 6 week period. This may be compared to the reduction from 27.3 per cent to 24.1 per cent in the controls. A similar effect was produced in the first 6 week period during which the incidence of positive findings in the test fell from 24 to 14 per cent, while in the control there was a rise from 22 to 25 per cent. In the third period little significant change was noted. These data are reported on a percentage basis rather than in numbers of individuals, since a transfer of men occurred during the observation period and there were some individuals from whom we could not obtain cultures at both the beginning and end of the test period. We cannot state at what time during the test period the change noted above occurred since only two cultures were

TABLE 2

Incidence of Positive Throat Cultures (hemolytic streptococci) in Test and Control Dormitories Before and After 6 Week Observation Period

	First Period		*Second Period*	
	Test	*Control*	*Test*	*Control*
Average incidence in incoming men, per cent	24	22	34	27
Average incidence in outgoing men, per cent	14	25	8	24

taken from each individual. It would be of interest to have more frequent cultures taken.

An attempt was made to analyze further the above data. This was done in the manner illustrated in Table 3 which represents the 6 week period from January 29 to March 10. Records were kept to show losers (positive initial throat culture, negative final throat culture); gainers (negative initial throat culture, positive final throat culture); and keepers (positive initial throat culture, positive final throat culture). Statistics on the first period were similar to those shown in the table, while little effect occurred in the third period.

The most significant finding was the greater number of losers, and the smaller number of gainers and keepers in the test as compared to the controls.

TABLE 3

Per cent Loser, Gainer, and Keeper in Individual Dormitories and Average Total Test and Control

Test	*Per cent Loser*	*Per cent Gainer*	*Per cent Keeper*
Dormitary 1	32	0	4
Dormitory 2	29	6	6
Dormitory 3	28	6	3
Dormitory 4	30	3	3
Control			
Dormitory 1	26	12	0
Dormitory 2	26	13	14
Dormitory 3	12	33	7
Dormitory 4	11	9	11
Average Test	30	4	5
Average Control	19	16	8

A similar system of recording losers, gainers, and keepers was used for the separate dormitories studying their oc-

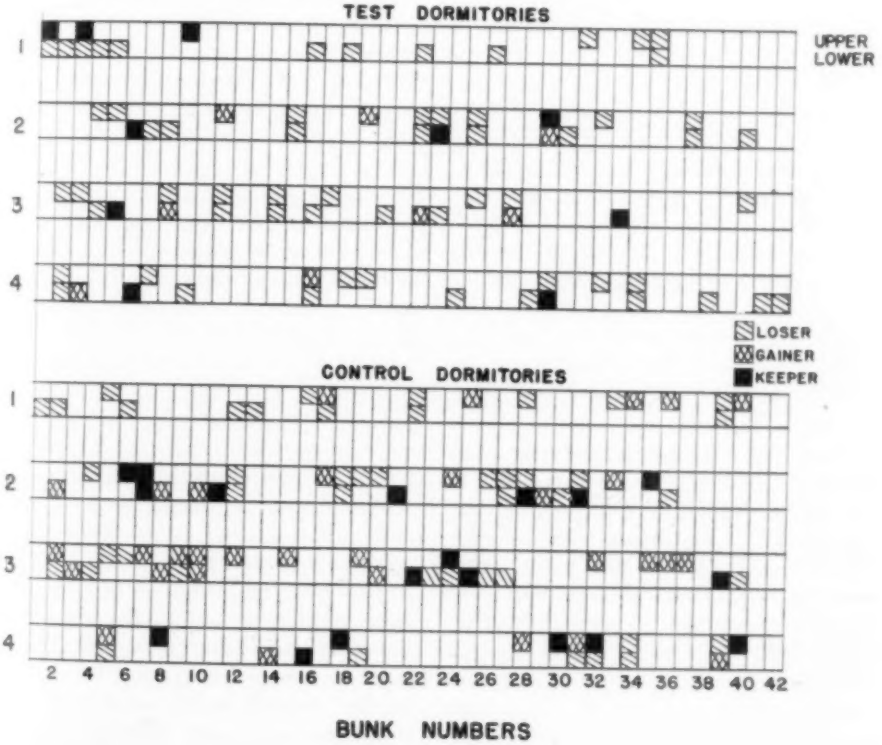


FIGURE 4—Record of individuals according to bunk location, showing losers, gainers and keepers

currence in relation to location of bunks. This is diagrammatically represented in Figure 4.

DISCUSSION

Incidence of Diseases—As stated above, we realized at the outset of our studies that certain limitations as to the conclusiveness of our observations were unavoidable. It is obvious that sources of cross-infections other than sleeping quarters would occur. We were unable to control the men during periods of classroom instruction, drill, eating, and leave. However, we felt that since the greatest reservoir of infection was present in the dormitories (other workers [10, 11] have presented evidence to substantiate this hypothesis), a demonstration of a statistically significant reduction in air-borne disease would be possible.

It was particularly unfortunate that an observation period longer than 6 weeks was not feasible since we appeared to be getting a most encouraging effect after an initial 3 week period of time had elapsed. The interpretation of this observation is not entirely clear but reasonable explanations may be presented.

From a study of Table 1, one can state that the men hospitalized for mumps during the first three weeks received their infection previous to their coming under our observation. This resulted in the fairly equal distribution in cases between test and control groups. It may further be seen that spread of the infection was reduced in the group sleeping in glycol-treated atmosphere. Considering the shorter incubation period of the more acute respiratory diseases, it does not seem possible to explain all our findings on this basis. However, it does suggest that under conditions of crowding and the bringing together of individuals from various walks of life and localities, the incubation period of these infections may be altered.

Another explanation may be considered. During the first few weeks when a number of individuals are placed in close contact, those most susceptible contract disease, and those less susceptible escape. During the entire 6 week period one can postulate the progressive building up of air and bed-clothing contamination in the dormitory. The use of glycol vapors prevents the contamination from reaching the concentration necessary to affect those individuals of lesser susceptibility, while in the control dormitories such action does not occur.

In this regard we wish to point out that the data on recovery of air-borne bacteria (Figure 3) does not give a true representation of the air bacterial population at all times. The counts include many non-pathogens and, of course, give no index of air contamination by viruses. The most significant observations gathered from the air sampling are the overall reduction in colony count and the practical abolition of hemolytic streptococci in the test dormitories.

The data recorded on the basis of observations in individual dormitories showed a consistency in the number of hospitalizations and infections from each. A study of infections according to the location of bunks in the dormitories suggested a greater degree of isolated cases in the test quarters, as compared to the controls where there were numerous clusters of infections. This was particularly well shown in the study of mumps. Another interesting observation in regard to the mumps epidemic was that in one control dormitory housing a group of men coming from a different station from those in the other seven dormitories, not a single case of mumps occurred. This lends further strength to the belief that most cross-infections occur in sleeping quarters, since there was complete intermingling of men during their work day.

An attempt to evaluate the influence of triethylene glycol vapors on outpatient visits was inconclusive. There were many difficulties encountered, such as incorrect diagnosis, multiple visits by single individuals, frequent visits by men who had no demonstrable infections, etc.

Throat Cultures—It is shown that in groups living in atmospheres containing bactericidal concentrations of triethylene glycol, the incidence of hemolytic streptococci found in the throat is reduced. This is demonstrated clearly in the first two periods where approximately 650 test and 650 control individuals were observed. A breakdown of the data suggests that this reduction is not due to the direct action of the glycol in the respiratory tract but is produced by its effect on the air-borne bacteria. It has been shown that in the test dormitories the difference between the initial and final cultures was caused by a greatly increased number of men developing negative throat cultures with only a small percentage developing positive cultures during the exposure period (Table 3). It would appear that in the test spaces, death of hemolytic streptococci occurs promptly when they are introduced into the air either by expression of the organisms directly from the respiratory tract, or secondarily introduced from bed-clothing, etc. This action prevents the dissemination of organisms to the throats of susceptibles. The increased number of "gainers" (Table 3) in the control dormitories further substantiates this hypothesis.

From a study of the data shown in Figure 4 it would appear that the presence of glycol in the test dormitories prevented the spread of hemolytic streptococci between adjacent bunks. There were very few gainers as compared to the control dormitories where new individuals developed positive throat cultures appearing in clusters radiating from previously demonstrated carriers. Control of the high local bacterial concentration about a carrier's bed produced by direct expression from the respiratory tract and secondary introduction from the bed-clothing is probably effected by glycol vapor.

It is significant to point out the observation made in the third period studied. This group of men served as an interesting control on the first two periods. With an inadequate glycol concentration there was no effect on either the incidence of infections or throat cultures. It would appear, therefore, that in large groups there is some correlation between frequency of occurrence of hemolytic streptococci in the throats of individuals under observation and incidence of respiratory disease in the group as a whole; and that an index of glycol efficiency may be determined by this effect. Although there was no apparent relationship between the incidence of hemolytic streptococci and infection in individuals, our data suggests that if glycolized air prevents the spread of hemolytic streptococci from one person to another, it also prevents the spread of other air-borne microörganisms including viruses.

CONCLUSIONS

1. Bactericidal concentrations of triethylene glycol and optimum humidity conditions were maintained in large living quarters.
2. A reduction in total bacterial air contamination was produced.
3. Hemolytic streptococci were practically eliminated from the air of glycol-treated dormitories.
4. A definite reduction in air-borne infections was effected.
5. Control of a small epidemic of mumps was attained.
6. Prevention of spread of hemolytic streptococci from the throat of one individual to another was demonstrated.

SUMMARY

A practical installation for triethylene glycol generation and distribution

was made in a military camp. Glycol concentrations of 0.0025 to 0.004 mg. per liter of air and optimum relative humidities were maintained. Studies were made on three groups of 640 men, observed for 6 week intervals and equally divided into test and controls; the former sleeping in glycol-treated quarters, the latter in untreated dormitories. An overall reduction in air-borne disease of 12 per cent was produced for the entire period, but the statistics on the final 17 days showed a reduction of 64 per cent. Explanations for this phenomenon are presented. The incidence of hemolytic streptococci recovered from throat cultures of men exposed to the effect of the glycol vapors fell dramatically in contrast to the control individuals. There was a definite prevention of spread of these organisms in the dormitories.

REFERENCES

1. Robertson, O. H. *The Harvey Lecture Series*, XXXVIII:227, 1942–43.
2. Bigg, E., Jennings, B. H., and Fried, S. Inflammability Characteristics of Propylene Glycol and Triethylene Glycol in Liquid and Vapor Form. *Am. J. M. Sc.*, 207:370–74 (Mar.), 1944.
3. Bigg, E., Jennings, B. H., and Fried, S. The Use of Glycol Vapors for Bacterial Control in Large Spaces. *Am. J. M. Sc.*, 207:361–69 (Mar.), 1944.
4. Bigg, E., and Jennings, B. H. The Introduction of Glycol Vapors for Air Sterilization by a New Vaporization Method. *J. Indust. Hyg. & Toxicol.*, 26:307 (Nov.), 1944.
5. Jennings, B. H., and Bigg, E. Engineering Problems in the Use of Glycol Vapors for Air Sterilization. *A.J.P.H.*, 34:477 (June), 1944.
6. Jennings, B. H., Bigg, E., and Olson, F. C. W. The Use of Glycol Vapors for Air Sterilization and the Control of Air-borne Infections. *Heat., Pip. & Air Cond.*, 16:538 (Sept.), 1944.
7. Wise, H., Puck, T. T., and Stral, H. M. A Rapid Colorimetric Method for the Determination of Glycol in Air. *J. Biol. Chem.*, 150:61, 1943.
8. Garrad, L. P. Selective Bacteriostatic Action of Gentian Violet. *Brit. M. J.*, 1:290–291, 1942.
9. Croxton, F. E., and Cowden, D. J. *Applied General Statistics*, 1942, p. 386.
10. Dudley, S. F. The Schick Test, Diphtheria and Scarlet Fever. Medical Research Council. *Spec. Rep. Series, No. 75*, 1923.
11. Dudley, S. F. The Spread of Droplet Infection in Semi-Isolated Communities. Medical Research Council, *Spec. Rep. Series, No. 111*, 1926.

Best Sellers in the Book Service for July

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945 ..... $1.00

The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 ..... .35

Global Epidemiology. James S. Simmons, M.D., Tom F. Shayne, M.D., G. W. Anderson, M.D., and H. M. Horack, M.D., 1944 ..... 7.00

Borderlands of Psychiatry. Stanley Cobb. 1944 ..... 2.50

Municipal and Rural Sanitation. V. M. Ehlers and Ernest W. Steel. 3rd ed., 1943 ..... 4.00

Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945 ..... 4.00

Vital Statistics Directory. American Public Health Association. 3rd ed., 1945 ..... .75

Nursing in Prevention and Control of Tuberculosis. H. W. Hetherington, M.D., and Fannie Eshleman, R.N. Rev. ed., 1945 ..... 3.00

Health Instruction Yearbook, 1944. Oliver E. Byrd, Editor. 1944 ..... 3.00

Order from the Book Service

Does Health Education Prevent Venereal Disease?*

The Army's Experience With 8,000,000 Men

CAPTAIN GRANVILLE W. LARIMORE AND
LIEUTENANT COLONEL THOMAS H. STERNBERG

Medical Corps, Army of the United States, Washington, D. C.

WITHIN the past three years the Army has had an unprecedented opportunity to study at first hand the results of the mass use of compulsory health education directed at a single group of infections, the venereal diseases. We have been able to apply intensively virtually all of the accepted techniques of health education, and it is our intent in this paper to describe the methods used and to delineate our experiences and results.

AN OUTLINE OF THE ARMY PROGRAM

The venereal disease education of the soldier is a continuing process which begins at the time of his induction and continues until his discharge. This educational process is inaugurated at the induction station with the distribution of a brief pamphlet. At the reception center, the next step in his military career, he is given talks on sex hygiene and venereal disease by a medical officer, a line officer, and a chaplain. In addition, he is shown a film on the subject and given another pamphlet. At the replacement training center where the soldier's basic military training is completed, two hours are devoted to venereal disease education, employing film strips, supplemented by talks by officers. After the soldier has completed his basic training and is assigned to a unit, his education in venereal disease is pursued by means of further talks at regular intervals, and by the use of additional films, pamphlets, posters, and other health educational media.

Since the first of January, 1944, when it became apparent that the trend of venereal disease incidence in the Army was upward, there has been an intensification of all of our control measures, particularly venereal disease education.

This intensification translated into the production of material has brought about a program for 1944 which calls for the production of two new films on venereal disease, a new film strip, two pamphlets for general distribution to troops in this country, and a schedule of one new venereal disease poster each month. In addition, utilization is being made on a local level of lectures, bulletins, charts, prophylaxis station lists, match-book folders, and other forms of reminders. Besides our venereal disease education program in this country we have distributed in overseas theaters, forty posters, several pamplets,

---

* From the Venereal Disease Control Division, Preventive Medicine Service, Office of The Surgeon General.

Presented before the Southern Branch American Public Health Association at its Annual Meeting in St. Louis, Mo., November 14, 1944.

and other materials particularly aimed at the specific problems of the different theaters. In all, it is expected that the total amount of graphic educational material distributed this year will approach 15,000,000 pieces and that our film audiences will be in the neighborhood of 10,000,000.

Thus, to our knowledge, the Army venereal disease educational program far exceeds any civilian experience for a comparable period. In fact, it is believed that the Army program represents, in extent and scope, one of the largest health education projects ever attempted in the field of preventive medicine.

AIMS OF ARMY VENEREAL DISEASE EDUCATION PROGRAM

The aims of the program have been to prevent venereal disease among troops through utilization of educational procedures as an adjunct to an overall control program, and to study and evaluate various types of educational materials and methods of approach. It became evident early that there are two distinct and separate phases of venereal disease education, and that failure to recognize these separate aspects in the use of education as a venereal disease control measure results in loss of effectiveness. These phases are:

1. The imparting to the individual of adequate technical knowledge about the venereal diseases, how they are spread, and how they may be prevented.
2. The motivation within the individual of the will to avoid either illicit sexual intercourse or unprotected sexual exposure.

Imparting technical knowledge—The imparting of technical knowledge to the soldier is essentially a function of the medical officer, utilizing the formal lecture and various training aids.

Motivation to avoid venereal disease—The mere possession of technical knowledge in itself is not sufficient to prevent venereal disease. It is necessary that the individual be motivated to use such knowledge when it is needed. In the Army, this motivation involves complex, and in many instances intangible factors, which are related to such diverse conditions as the religious and educational background of the soldier, the influence of the home and community, the attitude of his commanding officer, the esprit de corps of his unit, fear of the diseases or their treatment, fear of shame or ridicule, and many others, over most of which the Army has little direct control.

METHODS OF APPROACH

Fundamentals—In converting these aims of the program into practical educational procedures we have learned that certain principles are essential for the successful use of education as a tool of venereal disease control. Chief among these are:

1. Each educational procedure regardless of type must be prepared or delivered with a particular purpose in mind. In short, hit or miss education is wasteful and relatively noneffective. The program must be planned so that each procedure fits into an overall coördinated whole, each part of which is interrelated to the other.
2. Health educational materials must be of the highest possible quality. In an effort to achieve this the Medical Department has sought and received the advice of experts in the field of motion pictures and the graphic arts. We have attempted to provide material that is attractive and readable, with the liberal use of art work and color. While such material may entail a greater cost of production, it is to be pointed out that in the final analysis the most wasteful and expensive health educational materials are those which are so drab or uninviting that they are not read at all but are rather promptly discarded by the recipient.
3. In all of our educational materials we have endeavored to abandon completely the pedagogical concept of health education and have striven for a new approach of what might be termed "health advertising." Our posters, pamphlets, and other materials do not talk down to the soldier; neither do they preach to him. Instead they are slanted in so far as possible in the language and atti-

tude of the "GI." We have tried to stay away from the textbook type of approach and instead have tried to emulate the techniques of the brochures and copy that have made American advertising the standard for the whole world.

4. We have also attempted to avoid overemphasis on the subject from the standpoint of sex and further have sought in the preparation of our materials not only to refrain from giving offense, but also to avoid that which is distasteful either esthetically or intellectually. We have also tried to make the educational approach such that it avoids any psychological impact that might be productive of future phobias about the venereal diseases or sex, for while we do want to instill a healthy respect for the venereal diseases and their consequences, we do not want to develop a group of venereal disease or sex neuroses.

5. Accuracy and technical correctness are principles which should be regarded as inviolable. This is particularly true at the present time when improved methods of treatment tend to minimize the potential physical damage of the venereal diseases. Loose statements of the bogeyman type will tend to discredit the entire program in the minds of those whom we wish to influence.

6. Continence is stressed as the only certain way of avoiding venereal disease and every effort is made to see that our material in no way presents the subject so that the individual who was continent when he came into the Army is influenced to change his sex habits to those of promiscuity.

MOTIVATION

As has been stated above, the basic aims of our venereal disease educational program are to impart technical knowledge and then to motivate the individual to use that knowledge at the time it is needed. The imparting of technical knowledge has been found to be a relatively simple, straightforward procedure, but that of motivation has been much more difficult of accomplishment. In fact we are frank to admit that we know of no single universally effective appeal to induce the soldier either to avoid exposure or to take prophylaxis. Further, the multitude of factors influencing human behavior dictate the necessity for a variety of approaches to this problem. In the Army, the most effective have been as follows:

1. *Fear* is the dominant theme of many of the appeals that have been successfully used. We realize that much of pedagogical and medical opinion will differ with us on the value of fear as a motivation; yet we have found that it operates in the minds of the soldiers as one of the most potent reasons for the avoidance of venereal disease. Fear is being used in this sense not only simply as a fear of the diseases themselves and the pain associated with them, but also as a fear of the effect on future health and home life; fear of the effect on sex capacity or the individual's ability to become a father; fear of punitive measures; and fear of the disease as representing positive proof of the violation of religious and moral codes. In our experience fear operates less as a deterrent to promiscuous sex exposure than it does as a motive for inducing the individual to take prophylaxis. There is one important aspect of the use of fear as a motivation that needs particular emphasis at this time, namely, that fear of the venereal diseases themselves will be decreasingly effective from now on, as improved techniques of therapy render them less and less serious, and perhaps eventually relegate them to comparatively minor infections.

2. *Intelligence*—Appeal to reason for the avoidance of the venereal diseases on logical grounds is of value with the more intelligent portion of our group. When this appeal is augmented with the theme that smart men don't get venereal disease, and that acquiring venereal disease is evidence of a degree of stupidity on the part of the individual, it becomes even more potent.

3. *Pride*—Pride has been found to be an effective appeal, not only reflected in the individual's pride in himself which makes him want to avoid venereal disease, but also pride in his unit, his race, and in the Army itself.

4. *Patriotism*—Into this category can be grouped all of the motivations related to the war itself, such as those that have their basis in appeals to stay on the job to "keep 'em rolling" or "keep 'em flying" and for each man to shoulder his fair share of the burden and not absent himself because of venereal disease. Another aspect that has been effectively used is based on the fact that a man who acquires a preventable infection such as venereal disease is indirectly giving aid or comfort to the enemy by taking up bed space and the time of medical personnel better devoted to caring for the wounded.

5. *Moral approach*—In our experience appeals to avoid venereal disease strictly on moral lines, through the avoidance of illicit sexual intercourse, have been of limited value. It is well to recall that venereal disease education as we use the term is not evangelism, it cannot substitute for the home, the church, or the school as a builder of character, nor can it provide a moral background for proper standards of personal conduct. Surveys of troop samples indicate that in a high percentage of instances the initial sex experience occurs prior to induction into the Army, and there is little to indicate that we have been at all successful in converting to continence those individuals who were promiscuous before their entry into the service.

Factors influencing motivation to avoid venereal disease—In analyzing the reasons for our failures to influence all of our soldiers to avoid venereal disease we have found that the following factors are among the most important:

1. The very nature of the sex urge itself which tends to cancel out much of the effects of our educational efforts.

2. Counter-propaganda against the practice of continence that we have termed "education for venereal disease." This is comprised by the sexually stimulating motion picture, the sexy comic strips, the pin-up girls, and the mass use of sex as a selling agent in certain advertising. All of these tend to glamorize and romanticize sex and its ever-present by-product, promiscuous sexual intercourse. Unfortunately this propaganda for sex exerts the greatest influence on the younger, more easily impressed age groups.

3. The effect of what is loosely termed "war psychology." It is the same mass reaction that has brought about an increase in juvenile delinquency and a flood of the so-called "Victory Girls." Basically, of course, this prevalent trend is to a great extent a current variant of the old "eat, drink, and be merry" proverb of long standing, accentuated through a wartime release of inhibitions. Translated into terms of our problem, we observe men throwing aside what they have been taught in a burst of so-called last fling activity, or giving vent to a flood of pent-up emotions upon returning from months of arduous and often dangerous duties.

4. The displacement of normal associations with family and friends, with a resultant disruption of customary relationships. which has operated as an effect of the war.

5. The newer methods of treatment which have already begun to lessen the concern of troops over the venereal diseases and their seriousness.

6. Alcohol, with its minimizing effect on inhibitions, has been a considerable factor in dulling the value of venereal disease education, particularly at the time the individual needs most to apply what he has learned.

7. Morale or esprit de corps of the man's unit is a prominent factor influencing the incidence of venereal disease. A man, dissatisfied at the moment with conditions in his Army service, is very prone to disregard what he has been taught about venereal disease, and it is believed by many that

the venereal disease rate represents a fair indication of the state of morale and discipline of a unit.

MEASUREMENT OF RESULTS

How then in the midst of these conflicting factors can we measure the results of our venereal disease educational program? Not entirely by examining our rates of venereal disease incidence; for while our rates for the nearly three years of this war are not only far less than those of any past war, but are also as low as those of any previous three years of the Army's history in peace or war, there are many other venereal disease control procedures in part responsible for them. Such rates represent the bookkeeping result of so many complex factors that it is difficult to abstract the rôle that venereal disease education alone plays.

Technical knowledge—Nor, as has already been pointed out, can we measure the effectiveness of our results in the terms of the amount of technical knowledge about the venereal diseases possessed by our soldiers. Surveys of random samples of troops indicate that we have succeeded very well on the whole in imparting adequate knowledge about the venereal diseases. In fact we found that there was often no significant difference between the knowledge about venereal disease possessed by groups who have acquired venereal disease and those free of infection, provided of course that the groups being compared were similar from the standpoint of age, length of service in the Army, and educational background prior to Army service.

On the other hand, it is believed that the best single criterion for determining the immediate value of education in preventing venereal disease in the Army is the extent to which prophylaxis facilities and materials are used. It is considered that this is a legitimate yardstick with which to measure the effectiveness of our educational program, since most soldiers were unfamiliar with at least chemical prophylaxis before entering the service. In determining the extent of the use of prophylaxis in the Army, consideration must be given not only to official station prophylaxis, which has been difficult to popularize because of factors such as inaccessability and lack of privacy, but also to the use of individual prophylaxis, both mechanical and chemical. The importance of the rôle which prophylaxis plays is indicated by the current Army requirements of more than fifty million individual prophylactic items monthly. Surely the utilization of this enormous number of prophylactics must prevent a vast amount of venereal disease, and is the result to a large extent of adequate venereal disease education.

SUMMARY AND CONCLUSIONS

1. The Army has had an unprecedented opportunity to study at first hand the results of the mass use of compulsory health education directed at a single group of infections, the venereal diseases.

2. The Army VD educational program has applied virtually all of the accepted techniques of health education, and its extent is such that during 1944 the amount of graphic educational material distributed will approach 15,000,000 pieces, and film audiences will total 10,000,000.

3. The aims of the program are (a) to impart technical knowledge about the venereal diseases, and (b) to motivate the individual to utilize this information at the time it is needed for the avoidance of venereal disease.

4. Certain principles have been found to be essential for the successful use of education as a tool of venereal disease control. Chief among these are (a) an integrated program, (b) highest possible quality and attractiveness of all educational materials, (c) abandonment of the pedagogical concept of health education and substitution of a new approach of "health advertising," (d) avoidance of overemphasis on sex, (e) technical accuracy of all materials.

5. In motivating the individual to utilize the knowledge he has been given, the following factors have been found to be effective as

appeals: (a) fear, (b) intelligence, (c) pride, (d) patriotism.

6. Among the reasons for failure of motivation are (a) the nature of sex urge itself, (b) "education for VD" afforded by sexy motion pictures, comic-strips, pin-up girls, and the use of sex in certain advertising, (c) "war psychology," (d) displacement of normal family and social relationships, (e) newer methods of treatment, (f) alcohol, (g) state of morale. The strictly moral approach to the problem of avoiding venereal disease has been relatively ineffective in the Army.

7. In measuring the results of the program, the best single criterion is believed to be the extent of utilization of prophylaxis in the Army, which at the present time is at the rate of more than fifty million individual prophylactic items per month.

Health Education Specialists on Local Health Department Staffs

The Association's Subcommittee on Local Health Units in its report published during the summer, recommends about 500 specialists in health education to serve the more populous of the 1,200 units of local health jurisdiction through which it believes local health service in Continental United States may be served with economy and efficiency. The committee report frequently points out that the most effective health education is done by the public health nurse in her family visiting and community contacts, by the medical and dental clinician in his hygiene instructions and his interpretation of medical findings, and by the public health engineer in his interpretation of environmental factors in personal and community hygiene.

In the more than 900 suggested units with populations of less than 100,000, the committee believes that, with only minimum resources, the health education work of doctors, public health nurses, and engineers must for economy be supplemented by the health education service of the state departments of health.

For 261, about one-fifth of the 1,200 units, the committee recommends 543 health educators. These would serve nearly 60 per cent of the population of the United States, in the ratio of approximately one per 130,000 population. In contrast, the committee found only 44 health educators employed by all local health departments in 1942. These were confined to 12 states.

The qualifications for health educators prepared by the Association's Committee on Professional Education in 1943,* estimated that at that time there were between 400 and 500 employed in both official and voluntary agencies in the United States (exclusive of teachers in public schools and colleges). It is unlikely that the pool of trained personnel in this field has been increased to more than 600 during the war period. There is an immediate need, therefore, for the training of approximately 500 specialists in health education to meet minimum local health needs. If the desirable goal expressed by many state health officers for a health educator in each unit regardless of population is to be met, more than 1,000 persons will need to be trained as health educators in the immediate or near future.

* Educational Qualifications of Health Educators. An Official Report of the American Public Health Association. *A.J.P.H.*, 33:8 (Aug.), 1943. Reprints available.

Amebiasis in a Hospital for the Insane

WILLIAM B. BIRNKRANT, M.D., MORRIS GREENBERG, M.D., AND CAPT. HARRY MOST, MC, AUS *

Bureau of Preventable Diseases, and the Bureau of Laboratories, Department of Health, New York, N. Y.

SURVEYS made in various parts of the western hemisphere have disclosed the existence of amebiasis in an appreciable portion of the population from Central West Canada (52° 30′ N. latitude) to the Strait of Magellan (52° S. latitude).[1] The presence of endemic foci has been disclosed wherever surveys have been made. The percentage of carriers reported varies markedly, depending on climate, economic and social status, crowding, environmental hygiene, laboratory techniques, and the experience of the technician. Thus, in Northern New Mexico and Arizona, Spector and Hardy [2] reported 25.5 per cent of a group of 2,725 Indians and non-Indians positive for cysts of *Entamoeba histolytica*, although the actual incidence of clinical dysentery was very low. Headlee,[3] on the other hand, found only 0.8 per cent of carriers of *Entamoeba histolytica* in a survey of intestinal parasitism in patients of the Indiana University Medical Center Hospital. Beltoan and Lorenas [4] reported an infection rate for *Entamoeba histolytica* of 47 per cent in a group of 410 pupils in a public boarding school in Mexico City.

From December, 1942, to August, 1943, an investigation of amebiasis was made by the New York City Department of Health in a hospital for the insane. An opportunity thus presented itself for making a survey of the institution. From May to December, 1942, 14 cases of amebic dysentery had been reported. An additional 81 cases and 124 carriers were found during the investigation, making a total of 95 cases and 124 carriers found between May, 1942, and August, 1943. These are the subject of this report.

CLINICAL DESCRIPTION

The cases were divided clinically into mild and severe cases. Mild cases had diarrhea as the chief, and often the only, symptom, without any blood in the stool. Fever was absent. The duration of the diarrhea was several days.

In severe cases diarrhea was marked and the stools were frequent. In almost all cases there was blood in the stools. Abdominal cramps were experienced by many. Fever occurred in all.

INVESTIGATION

The investigation was carried on by the New York City Department of Health with the coöperation and help of the New York State Department of Health during the latter part. Until February 15, 1943, all laboratory examinations were made by the pathologist of the hospital. Beginning on this date and until April 30, 1943, the parasitologist of the City Department of Health was placed in charge of the

* On leave of absence. This work was completed prior to co-author's entrance into military service.

laboratory survey, and the actual work of stool examinations was performed at the hospital by two experienced technicians of the department, aided by two more technicians loaned by the New York State Department of Health.*

There were examined 5,882 stool specimens from 1,249 inmates and 688 employees. The zinc flotation method of Faust was used to examine all specimens. In addition, saline and iodine smears of fresh, warm specimens were examined from every individual with symptoms of diarrhea, and from a number of symptomless carriers. An average of 8 specimens per case and 3 specimens per person in the survey was examined (Table 7).

THE HOSPITAL

The institution is composed of a group of 45 buildings. Eight large buildings are used for housing inmates. At the time of the investigation there were 4,767 inmates and 808 employees. There had been 1,165 admissions and 1,130 discharges and deaths during the year. This represented an approximately average annual turnover.

There are 3 large and 2 small kitchens supplying food for inmates and employees. Kitchen 1 supplied 1,519 inmates and employees. In kitchen 2, food was prepared and served to about 2,364 inmates and employees. In kitchen 3, food was prepared for a total of 1,320 inmates and employees. Kitchen E supplied the doctors' dining room where 123 doctors and staff members ate. On an 80 acre farm, fruits and vegetables are grown and chicken houses are maintained for egg production. A small kitchen is maintained for the 16 farm workers. Nine employees did not eat in the institution.

SANITARY SURVEY

A complete sanitary survey was made of the hospital.* It included the water and milk supplies, the sewage disposal, and the methods of storing, handling, cooking and distributing food for employees and inmates. Although this institution, like others of its kind, suffered during this period from a shortage of competent help, and although a number of inmates were used as food handlers in the kitchen, the general level of sanitation was fair.

WATER SUPPLY

The water supply comes from four wells 600 to 800′ deep. The effluent of all four wells is run through a bed of marble chips and then to a treatment house where hydrated lime is fed from a proportioner into the water for the purpose of raising the pH. The water is run into a 1,000,000 gal. capacity reservoir, covered with concrete. From the reservoir, the water is pumped into a 368,000 gal. steel stand pipe 100′ high. Water for general purposes, including fire, comes from the standpipe and is fed through a single system of distribution mains.

SEWAGE DISPOSAL

The sewage disposal is part of the general sewage disposal system of New York City.

PLUMBING

A number of plumbing hazards were found. These included cross-connections of several bubble drinking fountains to waste pipes, submerged inlets and obstructed and overflowing water closets. Two aspirators in the laboratory and one in the autopsy room were connected to the cold water supply without intermediate vacuum breakers or check valves. The aspirators in the laboratory were used to clean pipettes; the one in the autopsy room was used to evacuate fluids from cadavers.

Water pressures taken at various fixtures in the cellars and top floors ranged from 44 to 80 lb. Uranium tests for back siphonage

* The technicians from the City Department of Health were Mrs. Mary V. F. LaRiviere and Mrs. Margaret Modin. They were assisted at different times by Albrecht Weber, Anne Orzel and Mrs. Helen Horton of the State Health Department.

* We are indebted to Messrs. C. G. Wigley, A. Abrahamson, and J. Schiftner of this department for their assistance.

were applied to the obstructed water closets and the aspirators. The results were negative. Tests were made on a cross-connected drinking fountain by plugging the trap and allowing the water to run into the basin until it had risen about an inch above the strainer on the outlet. The fountain was then turned on and a sample of water taken for bacteriological examination. The sample revealed no bacteria and no *B. coli*. Methylene blue was then added to the water in the basin. The water of the fountain was then turned on and 50 ml. samples were drawn into bacteriological sample bottles. In one of the fountains a blue color appeared in the fifth bottle. In the other, the water remained clear in the twentieth bottle.

Thirty-three samples of water were obtained from different parts of the buildings for bacteriological analysis, and one for chemical analysis. None contained *B. coli*. Two one-liter samples were obtained from the bubble drinking fountains, and delivered to the Parasitology Clinic. Settling was allowed for three days, after which the upper 900 ml. were siphoned off. The remaining 100 ml. were treated by the zinc sulfate flotation method. No amebae were found.

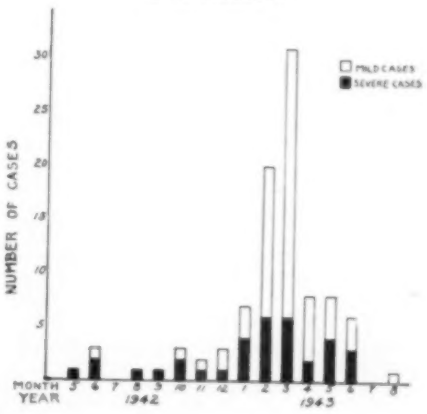
MILK

Pasteurized milk was used throughout the hospital, except for a small supply served to the resident physicians and other staff members and their families. This supply came from a small dairy composed of two heifers and three milking cows which produced 40 quarts of milk daily. The milk was used raw and was produced under insanitary conditions, and without sterilization of equipment. Closure of the dairy was recommended. In spite of the unsatisfactory conditions in this dairy, it apparently played no part in the spread of the outbreak, since the incidence of amebiasis was unusually low in the group served by it. Among all the people who used this milk regularly, only two physicians developed amebiasis, and they had sufficient opportunity to get the infection in other ways.

CASE INCIDENCE

From May through December, 1942, 14 cases were reported. Thereafter, cases increased rapidly; their recognition was probably a result of the intensive investigation. There were 7 in January, 20 in February, and 31 in March, 8 in April, 8 in May, 6 in June, and 1 in August, a total of 95 (Chart 1).

CHART 1
AMEBIASIS IN A STATE INSTITUTION
CASE INCIDENCE



Of the total number, 65 occurred in inmates and 30 in employees. When classified according to severity, there were, among the inmates, 28 severe and 37 mild cases, and among employees, 7 severe and 23 mild cases. The incidence of cases was 1.7 per cent in the entire institution. It was 1.4 per cent in inmates and 3.7 per cent in employees (Table 1). An average of 9.7 stools was examined per individual among the employees and 7.3 among the inmates.

TABLE 1

Number and Per cent of Cases and Carriers

		Cases						*Carriers*		
		Severe Cases		*Mild Cases*		*Total Cases*				
	Number in Institution	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*Number Examined*	*No. of Carriers*	*Per cent Carriers*
Employees	808	7	0.9	23	2.8	30	3.7	638	35	5.5
Inmates	4,767	28	0.6	37	0.8	65	1.4	1,184	89	7.5
Total	5,575	35	0.6	60	1.1	95	1.7	1,822	124	6.8

When the 65 cases in the inmates were broken down by wards according to the type of inmate, it was found that there were 30 wards with mild mental cases whose hygienic habits were good. These had a census of 2,674 and 16 cases of dysentery, an attack rate of 0.6 per cent. The moderately deteriorated inmates, whose sanitary habits were rated as fair, were housed in 13 wards with a census of 698; 9 cases of dysentery occurred, giving an attack rate of 1.3 per cent. The most severely deteriorated cases, with poor hygienic habits, were housed in 29 wards with a census of 1,395. The largest number of cases, 40 was reported from these wards; the attack rate was 2.9 per cent (Table 2).

TABLE 2

Cases in Inmates According to Their Mental Deterioration

Type of Inmate	*No. of Wards*	*Census*	*No. of Cases*	*Attack Rate Per cent*
Mild Mental Habits good	30	2,674	16	0.6
Moderate Mental Habits fair	13	698	9	1.3
Severe Mental Habits poor	29	1,395	40	2.9
Total	72	4,767	65	1.3

More than half the cases in inmates occurred in the connected buildings R and S. Analysis of the cases in these buildings shows the same difference as in the hospital as a whole. The population in the wards reserved for the mild and moderate mental cases, with good or fair sanitary habits, was 534 and that in the wards with the severely deteriorated cases, with poor sanitary habits, was nearly the same, 546. Yet, only 6 cases occurred in the former group, a morbidity rate of 1.1 per cent, while 30 cases occurred among the latter, a rate of 5.3 per cent.

There were 30 employees who had dysentery. Half of them worked as attendants on wards, fairly well scattered in all the buildings. The others worked in various occupations in the institution, as painters, carpenters, chauffeurs, etc. The latter had no close association with patients on the wards. The dates of onset in the 30 cases were spread over a 6 month period, from December, 1942, to June, 1943. One small group of 4 painters and a carpenter who ate together in the dining room of kitchen 1, became ill at about the same time. They had little or no contact with patients. It appears that this was a small food-borne outbreak.

CARRIERS

Stool specimens were obtained from 1,822 symptomless individuals in the institution, of whom, 1,184 were inmates and 638 employees. The incidence of amebiasis was found to be 7.5 per cent in the inmates and 5.5 per cent in the employees. It was 6.8 per cent in the entire group surveyed (Table 1). An average of 2.6 specimens was examined per inmate, and 3.2 specimens per employee.

OCCUPATION

There were 374 inmates and 116 paid employees working in the kitchens. Of the inmates, 283 were helpers, 1 was a cook, 10 were bakers, 5 butchers, and 75 waitresses. Of the paid employees, 69 were helpers, 18 cooks, 4 bakers, 2 butchers and 23 waitresses. An average of 3.3 stool specimens per food handling employee and 3.6 specimens per food handling inmate was examined. Examination revealed 7 carriers among the paid employees, a rate of 6 per cent, and 52 among the inmates, a rate of 13.9 per cent. Paid employees who handled food as part of their duties were 65 nurses, with 5 carriers, and 416 attendants, with 22 carriers. The total carrier rate among paid employees who handled food as a sole or partial occupation was 5.7 per cent. One carrier was found among 41 paid employees who did not handle food, a rate of 2.4

TABLE 3

Carriers According to Occupations

	Inmates			*Paid Employees*		
	Total Number	*No. of Carriers*	*Rate Per cent*	*Total Number*	*No. of Carriers*	*Rate Per cent*
Food handlers						
Kitchen Helpers	283	39	13.8	69	4	5.8
Cooks	1	0	0.0	18	1	5.5
Bakers	10	0	0.0	4	1	25.0
Butchers	5	2	40.0	2	0	0.0
Waitresses	75	11	14.6	23	1	4.3
Total	374	52	13.9	116	7	6.0
Nurses	0	0	0.0	65	5	7.7
Attendants	0	0	0.0	416	22	5.3
Total food handlers	374	52	13.9	597	34	5.7
Non-food handlers	810	37	4.6	41	1	2.4
Total employed	1,184	89	7.5	638	35	5.5

per cent. In 810 non-food handling inmates, the carrier rate was 4.6 per cent (Table 3). The number of stool specimens examined per individual was about the same in the food handling as in the non-food handling employees, 3.3 and 3.0 respectively. In the case of inmates, almost twice as many stools were examined per food handling as per non-food handling individual, 3.6 and 1.9 respectively.

DURATION OF EXPOSURE

An attempt was made to determine the effect of the length of time spent in the institution on the incidence of the carrier state. As will be seen by reference to Table 4, no significant increase in the carrier rate occurred with increase in the length of residence.

AGE AND SEX

The distribution of inmates and employees in the institution according to age and sex during the period of study was not available to us. The only figures giving sex distribution of inmates available were those of the admissions of inmates for the fiscal year 1941–1942. There were 396 males and 509 females, 45 and 55 per cent respectively. The same sex distribution obtained among the 89 inmates and the 35 employees who were carriers. However, of the 65 cases that occurred in inmates, and also of the 30 cases in employees, 60 per cent were in males and 40 per cent in females.

The age distribution for inmates admitted in the fiscal year 1941–1942, as well as the age distribution of cases and

TABLE 4

Number and Per cent of Carriers According to Length of Time in Institution

Duration of Exposure	*Number Examined*			*Number Carriers*			*Per cent Carriers*		
	Total	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*
1–3 months	109	69	40	9	6	3	8.3	8.7	7.5
3–6 months	80	38	42	2	0	2	2.5	0	4.8
6–12 months	176	66	110	8	1	7	4.5	1.5	6.4
0–1 years	365	173	192	19	7	12	5.2	4.0	6.3
1–2 years	227	65	162	10	2	8	4.4	3.1	4.9
2–3 years	177	54	123	12	5	7	6.8	9.3	5.7
3–5 years	202	70	132	10	4	6	5.0	5.7	4.5
5 years +	947	422	525	73	32	41	7.7	7.6	7.8
Total	1,918	784	1,134	124	50	74	6.5	6.3	6.5

TABLE 5

Admissions to Institution, Fiscal Year 1941–1942; and Cases and Carriers in the Study Period, May, 1942–August, 1943, by Age

	Admissions		Cases		Carriers	
Age	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
0–19	38	4.2	0	0	0	0
20–29	88	9.7	11	16.9	6	6.7
30–39	127	14.0	10	15.3	28	31.4
40–49	151	16.6	14	21.5	25	28.0
50–59	136	15.0	18	27.7	18	20.2
60–69	164	18.1	6	9.2	10	11.2
70+	201	22.2	6	9.2	2	2.2
Total	905	100.0	65	100.0	89	100.0

carriers among inmates during the study is given in Table 5. About 50 per cent of all cases and carriers occurred in the 40 to 60 age groups, although these made up about 30 per cent of the admissions. There were no cases nor carriers in the 0–19 group. The older group, 60 and over, accounted for 40 per cent of all admissions, but only 18 per cent of all cases and 13 per cent of all carriers.

RESULTS OF STOOL EXAMINATIONS

In Table 6 are listed the intestinal parasites found in the stools of the 1,917 individuals examined. Two or more parasites were not infrequently found in the specimen of the same individual. The commonest parasite found was *Entamoeba coli* (29.8 per cent); the next most common was *Entamoeba histolytica* (11.5 per cent). Then followed *Enterobius vermicularis* (3.4 per cent), *Giardia lamblia* (2.7 per cent), *Endolimax nana* (2 per cent), *Iodamoeba butschlii* (1.3 per cent) and *Trichomonas hominis* (1 per cent).

Sawitz and Faust [7] have pointed out that the probability of finding parasites in the stools increases with the number of specimens examined. Intestinal parasites were found in 753 of the 5,882 specimens examined from 1,917 individuals. An analysis was made of the number of stools that had to be examined from each individual before parasites were found. There were 219 stool specimens positive for *Entamoeba histolytica*. With a single examination, 61.5 per cent of all positives were discovered. The examination of a second stool specimen added 19 per cent. A third stool examination brought the total up to 93 per cent, a fourth specimen to 97.6 per cent, and a fifth to 98.5 per cent. The other intestinal parasites listed in Table 6 were recovered from 711 fecal specimens. A first examination discovered 66 per cent; a second stool specimen, 83 per cent; a third specimen, 94 per cent; a fourth specimen, 96 per cent; and a fifth, 98 per cent.

It should be pointed out that our results are not at all comparable to those of Sawitz and Faust. They ex-

TABLE 6

Number and Per cent of 1,917 Individuals Examined, Harboring Intestinal Parasites

Name	*Number*	*Per cent*
Protozoa—		
Entamoeba histolytica	219	11.5
Entamoebae coli	571	29.8
Endolimax nana	39	2.0
Dientamoebea fragilis	1	.05
Iodamoeba butschlii	24	1.3
Flagellates—		
Giardia lamblia	51	2.7
Chilomastix mesnili	4	.2
Trichomonas hominis	20	1.0
Helminths—		
1. Roundworms		
A. *Enterobius vermicularis*	65	3.4
B. *Trichuris trichiura*	9	.5
C. Hookworm	1	.05
D. *Strongyloides stercoralis*	2	.1
E. *Ascaris lumbricoides*	3	.2
2. Tapeworms		
A. *Hymenolepis nana*	2	.1

amined an equal number of specimens from each individual and arrived at an index of efficiency by getting a ratio between the number of specimens found positive and the number examined from each of the positive individuals. Since we began treatment as soon as an individual was reported positive, such a calculation would have been biased. We therefore report the number of specimens examined from each individual before a positive was obtained. Our percentages are necessarily higher than those of Sawitz and Faust. With the same technic, they obtained 21 per cent positives in a first examination, and 38, 51, 61, 69, and 76 per cent positive with a second, third, fourth, fifth, and sixth examination.

HOUSEHOLD CONTACTS

Since a considerable number of employees lived with their families outside the institution, a follow-up study was made of 48 household contacts to 26 employees who were cases or carriers. None had symptoms of dysentery. Three stool specimens were examined from each. No amebae were found.

TREATMENT

Patients with amebic dysentery were hospitalized, isolated in one wing of the sick-bay and were given one injection of emetine hydrochloride (0.06 gm.) per day for 3 days. Chiniofon therapy was instituted concurrently with the emetine hydrochloride and carried through for 10 days. Twelve tablets of 0.25 gm. each were given per day as the usual dosage. On the 7th and 8th day, cold stool specimens and on the 9th day a warm stool specimen, following a saline cathartic, were examined to determine the presence of amebae. A 4 day rest period was instituted from the 11th through the 14th day, following which one tablet of carbarsone (0.25 gm.) was administered four times a day for a period of 10 days. In weak or malnourished patients, the dosage was reduced to one tablet two or three times per day. The carbarsone therapy ended on the 24th day from the beginning of the chiniofon treatment. On the 26th and 27th days, cold stool specimens were submitted and on the 28th day a warm stool specimen was examined. If these specimens were negative, the treatment was discontinued if the patient had been a carrier. If the patient had been an active case, a course of diodoquin, twelve tablets of 0.2 gm. each per day, was administered in addition for a period of 7 days. On the 25th day after the institution of therapy, in active cases, treatment was ended, provided a cold and a warm post-cathartic stool specimen were negative for amebae.

TABLE 7

Number of Specimens Examined from Each of 1,917 Individuals

Number of specimens	*Number of Individuals*
1	558
2	194
3	736
4	162
5	63
6	37
7	37
8	37
9	35
10	26
11	17
12	6
13	5
14	1
15	1
24	1
26	1
5,882	1,917

A clinical and laboratory cure was obtained in all cases. Two stool specimens were examined from each case and carrier every 6 months after cessation of treatment. The zinc flotation method of Faust was used. Two of the amebic dysentery carriers were found to have *Entamoeba histolytica* cysts, one 15 months and one 10 months after cessation of treatment. Neither patient complained of gastrointestinal

symptoms at any time during the period of observation. Four of the amebic dysentery cases had recurrent attacks of diarrhea. Stool specimens of each of these cases were positive for trophozoites of *Entamoeba histolytica*. In one case the diarrhea occurred 11 months after the original attack, in two cases 13 months, and in one 15 months afterward. Furthermore, 3 other individuals who had had amebic dysentery were found to be symptomless carriers of *Entamoeba histolytica* cysts approximately one year later. Thus of a total of 219 cases and carriers treated, there were 9 recurrences; in 5 as symptomless carriers, and in 4 as clinical cases.*

DEATHS

There were 10 deaths, all preceding the institution of the program of treatment as outlined above. Seven had received no treatment for the amebiasis, 2 had received some treatment with emetine, and 1 with emetine and acetarsone. Eight were autopsied. Seven showed advanced ulcerative lesions of the colon. In 2 cases there was a rupture of the gut with localized peritonitis; in 2 others, there was matting of the gut with localized peritonitis at the site of a deep seated ulcer. Three had ulcerations of the gut, but no rupture. Liver abscess occurred in 1.

Nine of the deaths were in males and one in a female. Three were in age group 40–50, 3 were 59 years old, one was 63, one 64, one 72, and one 80 years of age.

COMMENT

The attack rate of cases in inmates was significantly higher on the wards where severely deteriorated mental cases were kept than on the wards where the milder mental cases resided. Since the hygienic habits of the former were very poor while those of the latter were fairly good, it appears likely that person to person contact played a large part in the spread of infection. This does not appear so obvious in the group of employees with dysentery. However, except in the small group of four painters and a carpenter, there is no evidence of an explosive outbreak such as occurs in common source epidemics. It is not improbable, nevertheless, that some of the other employees were infected in the dining room through the medium of food prepared or handled by one of the many carriers who worked there.

The sudden increase in cases in February and March was apparently due to better reporting of cases of diarrhea, together with the designation of all such cases "amebic dysentery" if *E. histolytica* trophozoites were found in the stool. There was not a comparable increase in the incidence of "severe" cases of amebic dysentery (Chart 1).

The carrier rate of 6.5 per cent in the entire group examined was not unduly high in comparison with carrier rates even in uninstitutionalized groups. Craig [13] reports an average of 11.6 per cent in 18 different surveys in the United States. Weinrich and Arnett [5] reported a 10.7 per cent prevalence in food handling student helpers, and 8 per cent among the food handling employees of a professional school in Philadelphia. Rasanicke and Palmer,[6] however, in a survey of 2,000 patients and 667 food handlers at the University of Chicago clinics reported 1.8 per cent of the patients and 2.4 per cent of the food handlers with amebiasis. Only one stool was examined for each individual. These rates would unquestionably have been higher had more than one stool specimen been examined and had the zinc flotation method of Faust been used.[7] These authors and others have reported a

* These cases and carriers may not have been recurrences but reinfections.

higher carrier rate in males than in females. Other surveys [2, 8] have indicated the opposite. There is some evidence [9, 10] to support the thesis that ulcerative lesions exist in carriers differing only in degree from those found in patients presenting definite symptoms of the infection, and that extensive lesions may exist without production of symptoms. It is likely, however, that most carriers present only superficial areas of necrosis of the mucous membranes which are rapidly healed. James and Deeks,[11] however, and Andrew and Atchley [12] believe that *E. histolytica* takes on pathogenicity only when it invades the tissues and that this is by no means a constant occurrence.

Although the case incidence was higher in employees than in inmates—3.7 as against 1.4 per cent—it is doubtful if the difference is real. Not all inmates were equally exposed, and it is quite possible that a number of inmates who were counted in the total population on which case incidence was based were never exposed. Second, it is possible that employees were more concerned, and reported mild diarrheas more regularly than the inmates. Third, an average of 9.7 stool specimens were examined from every case in the employees, and 7.3 from every case in inmates. As regards carriers, the difference in rates between employees and inmates—5.5 and 7.5 per cent—is not statistically significant. There is also no significant difference in rates between the food handling and non-food handling employees. There is a significant difference between the rates in food handling and non-food handling inmates. However, that difference might be due to the fact that on an average nearly twice as many specimens were examined from each food handling employee as from each non-food handling employee.

Regardless of other considerations such as economic or administrative feasibility, the fact that 13.9 per cent of the food handling inmates were carriers of *Entamoeba histolytica* raises the question of the wisdom of employing such individuals as food handlers.

SUMMARY

1. An investigation of amebiasis was carried on in a state institution from December, 1942, to August, 1943. There were found 95 cases in a total population of 5,575 inmates and employees, and 124 carriers in 1,822 well persons surveyed. Ten deaths occurred, all before the institution of a program of intensive treatment. There was no indication that the infection was water-borne. There was a significant difference in case rates between inmates with poor sanitary habits and those with good or fair habits. About 14 per cent of the 374 inmates employed as food handlers and 6 per cent of the paid employees who handled food for others were found to be carriers. It is believed that the infection was spread by person to person contact, and possibly also through the medium of food. A small explosive outbreak, apparently food-borne, occurred in a group of five employees. It is pointed out that inmates of a mental institution are ill equipped to appreciate the importance of personal hygiene, and had better not be employed in food handling occupations.

REFERENCES

1. Faust, E. C. The Prevalence of Amebiasis in the Western Hemisphere. *Am. J. Trop. Med.*, 22: 93–105 (Jan.), 1942.

2. Spector, B. K., and Hardy, H. V. Studies of the Acute Diarrheal Diseases. *Pub. Health Rep.*, 54:1105–1113 (June 23), 1939.

3. Headlee, N. W. Intestinal Parasite Infections among Patients of the Indiana University Medical Center Hospital. *Am. J. Trop. Med.*, 22:341–350 (May), 1942.

4. Beltoan, E., and Lorenas, R. Protozoarias Intestinales en una Communidad Escolar de la Ciudad de Mexico (Intestinal Protozoa of a School Community in Mexico City). *Rev. Inst. Salubridad y Enfermedades Trop.* Mexico, 2:193–212 (Sept.), 1941.

5. Weinrich, D. H., and Arnett, J. H. Results of a Protozoalogical Survey of Foodhandlers at a Professional School in Philadelphia. *Am. J. Trop. Med.*, 22:107–115 (Jan.), 1942.

6. Rodanicke, E., and Palmer, W. L. Current Experiences with E. Histolytica Infection in Chicago. *Illinois M. J.*, 81:458–463 (June), 1942.

7. Sawitz, W. G., and Faust, E. C. The Probability of Detecting Intestinal Protozoa by Successive Stool Examinations. *Am. J. Trop. Med.*, 22:131–136 (Mar.), 1942.

8. Massie, F. M. Endemic Amebiasis. *Internat. Clin.*, 2:207–216 (June), 1941.

9. Craig, C. F. The Pathology of Amebiasis in Carriers. *Am. J. Trop. Med.*, 12:285–299, 1932.

10. Hiyeda, K., and Suzuki, M. Pathological Studies of Human Amebic Ulcers, Especially Those of Carriers. *Am. J. Hyg.*, 15:809–823 (May), 1932.
11. James, W. M., and Deeks, W. E. The Etiology, Symptomatology and Treatment of Intestinal Amebiasis. *Am. J. Trop. Med.*, 5:97–136 (Mar.), 1925.
12. Andrews, J., and Atchley, F. Negative Occult Blood Tests in Carriers of the Dysentery-producing Endamoeba Histolytica. *J.A.M.A.*, 99:1340–42 (Oct. 15), 1932.
13. Craig, Charles F. *Amoebiasis and Amoebic Dysentery*. Thomas, 1934, Ch. III, p. 45.

ACKNOWLEDGMENT: We are indebted to Dr. James E. Perkins, Director, Division of Communicable Diseases, and Dr. Robert F. Korns, Epidemiologist, New York State Department of Health, for their active coöperation in this study.

Existing Permissive Health Unit Legislation

The historical pattern of local health service in the United States is the city, town, village, or township, except in some of the western and southern states where county organization is the rule. *Local Health Units for the Nation*, the report of a two year study by an Association committee, finds this an anachronistic pattern for the present day of large population aggregations, speed of transportation, and interdependence of urban and rural areas.

It suggests that no unit of local government below the county level should undertake to organize its own local health department, that a city and the surrounding rural area in the county have a single unit of local health jurisdiction, and that counties having populations well below 50,000 should join with some of their neighbors to form a district health unit of at least 50,000 persons. This is the smallest population that the committee believes can support a local health service, including a full-time medically trained health officer, one public health nurse per 5,000 population, one engineer and one sanitarian per 50,000 population, one clerk per 15,000 population, and dental health service. Thus it suggests 1,197 units for the 3,070 counties, an average of nearly three counties per unit.

Even were political, financial, and personnel factors presently favorable, existing legislation of some states does not authorize, though it seldom specifically prohibits, city-county or multi-county health units. In a study of existing legislation, the U. S. Public Health Service found in 1944 that one state had a legal mandate and 21 states authorization for multi-county health units. 5 states for county but not multi-county units, and 7 states for the formation of health districts by one or more contiguous towns or cities; 14 states had no provision for county or multi-county health units. In 3 of these, permissive legislation was enacted in 1945. In a number of other states such bills were introduced but not passed.

Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum*

JOSEPH ZICHIS, PH.D., AND HOWARD J. SHAUGHNESSY, PH.D., F.A.P.H.A.

Division of Laboratories, Illinois Department of Public Health, Chicago, Ill.

IN 1940 we published our studies [1] on the treatment of experimental Western equine encephalomyelitis with specific hyperimmune rabbit serum. The results reported in our paper showed that about 70 per cent of the animals were successfully treated when serum was administered in sufficient quantity after visible signs of the disease were noted.

Both before and after the publication of our studies, other reports have been made on serotherapy in Western equine encephalomyelitis.

In 1932 Howitt [2] described her studies on the use of antiserum in experimental Western type of the disease. She employed serum that was prepared in rabbits and found it was effective in preventing death in guinea pigs when given 4 hours after intracerebral inoculation of virus. When guinea pigs were given serum 48 hours after intranasal instillation of the virus, they survived.

It is regrettable that Howitt did not describe the disease condition of the animals at the time she gave them serum, as it would be important to know if they showed signs of the disease at that time.

Wyckoff and Tesar [3] were unsuccessful in their attempts to treat monkeys with serum when treatment was begun after the onset of fever. Two 10 ml. doses of antisera prepared in horses were given each animal. We believe that their failure was probably due to the insufficient quantity of serum used.

Fulton [4] reported that he was not able to prevent death in guinea pigs with horse antiserum after they were injected intracerebrally with Western virus. It is not possible to discuss his results because protocols were not given. It may be said, however, that a very severe fulminating type of disease, which would be very difficult to treat by any means, follows the inoculation of guinea pigs with virus by the intracerebral route.

Traub [5] reported that he was able to prevent death in guinea pigs with antiserum in the early stages of the disease resulting from inoculation with either Western or Eastern virus by the plantar route. Following this method of inoculation the disease exhibited a diphasic febrile reaction. Traub's results are of special interest because he was able to effect successful treatment in the early stages of the disease by giving each of his animals about 1 ml. of serum. This is a very small quantity of serum compared to that used by us. In our previous studies we found that from 15 ml.

* Based upon a paper presented at a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

to 70 ml. of serum gave good results in the treatment of guinea pigs but in the experiments reported here more consistent results were obtained with quantities of 15 ml. to 125 ml.

More recently Olitsky and his coworkers [6] reported that in their studies they were unable to treat Western equine encephalomyelitis effectively with antiserum in guinea pigs and mice after the onset of signs of encephalitis. Also they could not prevent death in mice when serum was given 24 and 45 hours after the virus. In these experiments the guinea pigs were given virus by the intralingual route and the mice by the intracerebral.

It is very difficult to analyze the results in this part of their publication because protocols were not given for two of the three treatment experiments and because their experimental procedures were not the same as ours. It is believed, however, that their failure to obtain preventive or therapeutic effects with antiserum may be explained on the basis that they used a low potency serum in the preventive experiments and that small quantities of serum compared with the quantities used by us were employed in the treatment experiments. In addition they gave serum by the subcutaneous route to mice 3 to 5 days after intracerebral injection of virus. After this interval of time the antibody should have been made readily available to combat the infection, but instead the serum was given by a route in which absorption is slow.

They also treated guinea pigs with one to three 1 ml. doses of serum starting 48 hours after inoculation of virus into the pads. At this time the animals were either in the first febrile phase or the afebrile interphase. Of 7 animals that received from 2 to 3 doses of serum 6 survived. When only one dose of serum was given, 2 of 4 animals died of the infection. These results indicate to us that serotherapy was effective in treating the disease in its early stages. They also bear out our observation that with larger quantities of serum, treatment is more effective.

Recently serotherapy has been employed in human Western equine encephalomyelitis. Gold and Hampil [7] reported the results of treatment of a patient who was accidentally infected with the Western virus. The patient was given 1,595 ml. of horse antiserum over a period of 5 days. Progressive improvement followed the administration of the serum up to the 10th day of the disease. At this time the condition of the patient became worse and 6 days later it was diagnosed as acute Parkinsonism. However, the patient finally recovered without showing any signs of definite damage of the central nervous system. Four months after onset of the disease the patient's serum showed a very high titer of the specific antibody.

During the Saskatchewan epidemic of Western equine encephalomyelitis in 1941,[4] specific serum of horse origin was used for treatment. According to the author, the effectiveness of the serotherapy was inconclusive. The report, however, states that 2,780 ml. of serum were given to 116 patients, indicating that small quantities of serum were given to each individual case. In addition, it is stated that of the 12 fatal cases 5 were given serum when they were moribund. Possibly the inconclusive results of treatment with serum were due to the fact that small quantities of serum were used and that some of the patients were given serum late in the course of illness.

This study deals with the treatment of experimental Western equine encephalomyelitis in guinea pigs and rhesus monkeys with specific hyperimmune rabbit serum. In the guinea pigs the treatment was begun when they showed visible signs of the disease and in monkeys at the onset of fever.

MATERIALS AND METHODS

Virus—The Kelser strain of Western equine encephalomyelitis virus was used in these studies. It was obtained in January, 1939, from Dr. Carl TenBroeck of the Rockefeller Institute for Medical Research and was maintained in this laboratory by serial intracerebral passages in guinea pigs.

Animals—Guinea pigs each weighing from 400 to 550 gm. and rhesus monkeys each weighing about 4 kg. were used for the serum treatment studies. Swiss mice of about 16 gm. weight were employed in the determination of the virulence of the virus and the potency of the antiserum.

Production of Western Equine Encephalomyelitis Antiserum—The virus used for the production of the antiserum was propagated in the developing hen's egg. After 11 days of incubation the eggs were inoculated with the virus and then reincubated until the embryos died. Usually they died about 18 hours after inoculation. The dead embryos were removed from the eggs and ground in a tissue mill. The ground tissue was adjusted to a 20 per cent suspension with buffered physiological solution of sodium chloride. The virulence of this virus was such that 0.03 ml. of the 10^{-8} to 10^{-10} dilution produced death in mice inoculated by the intracerebral route.

The immunization of the rabbits was carried out by injecting them intravenously on Monday, Wednesday, and Friday of each week with 20 per cent suspension of the living virus. The following schedule of immunization was employed for each animal: two 0.1 ml., two 0.25 ml., two 2 ml., two 5 ml. doses; all subsequent doses were 10 ml. It was found necessary to inoculate each rabbit with 10 ml. of the virus three times a week for at least 12 to 16 weeks before a serum of high potency could be obtained.

The serum was bottled without a preservative. It was found necessary to heat the serum at 56° C. for 30 minutes just before it was used therapeutically because the unheated serum produced severe serum reactions in a large per cent of the sick guinea pigs.

Potency Determination of the Antiserum—Swiss mice were used for these tests. Each of 12 mice was injected subcutaneously with 1 ml. of one of the following dilutions of the serum: undiluted 1–10; 1–500; and 1–1,000. The dilutions of serum were made with physiological solution of sodium chloride. Sixteen hours after the administration of the serum each mouse was injected intracerebrally with about 5 m.l.d. of the virus. To demonstrate the virulence of the virus, 12 normal mice were similarly injected with the same virus preparation. The mice were kept under observation for 20 days following the injection of virus.

Virus derived from an infected guinea pig brain was employed in the serum potency tests. The m.l.d. of the virus was predetermined and the dilutions containing the desired number of m.l.d.'s were stored in dry ice at about —70° C. Under such conditions the virulence of the virus did not change for at least 4 months.

The potency of the antiserum was expressed in terms of mouse protective units per ml. The end point was considered as that dilution of the serum which protected at least two-thirds of the mice, provided that in the lower dilutions at least two-thirds of the mice were protected and all of the control mice died. The unit value was established in the following manner: If 1 ml. of a 1–500 dilution of a serum protected at least two-thirds of the mice, the serum was considered as having 500 mouse protective units per ml. If the antiserum protected only two-thirds of the mice when given undiluted, it was regarded as having one unit per ml.

EXPERIMENTAL TREATMENT OF GUINEA PIGS

In these experiments the guinea pigs were treated with Western equine encephalomyelitis antiserum only when they were visibly sick. An animal was adjudged visibly sick if it showed the following: rough hair, humped position, sagging abdomen, anorexia, evidence of pain upon movement, weakness and fever. In addition to these signs most of them, when treatment was started, also showed ataxia and a few, paralysis. The majority of the animals were treated with serum at the time ataxia was first observed. However, in a few cases the animals received treatment before they showed ataxia. These animals were very sick and without treatment usually became prostrated and died without showing obvious signs of central nervous system involvement. Usually the animals that received treatment before showing ataxia, developed this condition and in a few cases paralysis before they began to recover.

Experiments 1 to 7—Before the guinea pigs were used for the experiments, they were kept under observation for about 20 days. The normal temperature of each animal was determined by recording it for about 4 to 6 consecutive days prior to the experiment.

The guinea pigs were inoculated by the intralingual route with a suspension prepared from a virus infected guinea pig brain. In Experiments 1 and 2 each animal was given 0.4 ml. of a 1–100 dilution of the virus whereas in Experiments 3 to 7 0.15 ml. of a 1–10 dilution was employed. These amounts of virus produced definite signs of infection in about 90 per cent of the experimental and control guinea pigs.

After the animals were exposed to the virus their temperatures were taken twice a day and they were watched very closely for signs of the disease. Excitability was usually the first sign that could be observed. As a rule it preceded fever by about 20 hours. The guinea pigs usually showed a rise in temperature for about 24 hours before they became visibly sick.

The antiserum was administered to the animals by the intraperitoneal route for the first 2 or 3 days of the illness and then by the subcutaneous route until recovery was complete. The quantity of serum that was used depended on the severity of the disease and how the animal responded to therapy. From 15 ml. to 125 ml. of serum was used to treat a guinea pig, the average amount being about 85 ml. In addition to giving the animals specific serum as it was needed, they were given supportive treatment. When the sick animals refused food, they were fed by placing thin slices of carrot in their mouths and were given water through a medicine dropper. In some cases normal saline solution was administered either by the subcutaneous or intraperitoneal route. In addition the animals were quartered in a thermostatically controlled room.

To avoid aggravation of the disease condition the temperatures of the guinea pigs in Experiments 1, 2, and 3 were taken only up to the time serum therapy was begun. Thereafter the signs of the disease were recorded for an additional 30 days, excepting for those that were killed earlier for histopathological studies. In Experiments 4 to 7 the temperatures were taken for the first 18 days of the experiment, after which the animals were kept under observation for an additional 37 days.

The control guinea pigs in Experiments 1, 2, 3, and 7 were given only supportive care whereas those in Experiments 4, 5, and 6 in addition to the supportive care were given normal rabbit serum. The quantities of normal serum used were equivalent to those of

G.P.	Observ	Aver Norm.	Days 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	55
1	Temp.	2.2	2.2	2.0	2.5	2.2	3.0	4.1	3.0	2.4	3.0	4.2	3.4	3.2	3.2	2.9	2.4	2.4	2.2	2.7	Not
	Cond.	N	N	N	N	S	S	SA	S	S	SI	S	S	I	I	N	N	N	N	N	Inc
	Treat.	-	-	-	-	-	25ip	20ip	10ip	10sb	5sb	-	-	-	-	-	-	-	-	-	
2	Temp.	2.6	2.0	2.0	4.2	2.6	2.0	1.8	2.0	2.0	2.6	2.2	1.9	2.2	2.4	2.1	2.3	2.3	2.6	2.3	Inc
	Cond.	N	N	N	SA	S	SI	SI	R	N	N	N	N	N	N	N	N	N	N	N	
	Treat.	-	-	-	15ip	15ip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	Temp.	1.8	2.4	2.3	2.4	3.0	4.3	3.0	2.4	2.4	1.9	1.9	2.0	2.0	2.4	2.1	2.4	2.4	2.7	1.7	Inc
	Cond.	N	N	N	S	SA	SA	S	SI	I	I	I	R	N	N	N	N	N	N	N	
	Treat.	-	-	-	-	25ip	20ip	10sb	5sb	-	-	-	-	-	-	-	-	-	-	-	
4	Temp.	2.2	2.2	2.3	3.2	4.2	4.0	3.0	3.0	3.0	3.2	2.1	1.5	2.7	2.1	2.5	2.7	2.7	2.0	2.0	Inc
	Cond.	N	N	N	E	SA	SA	S	I	I	R	N	N	N	N	N	N	N	N	N	
	Treat.	-	-	-	-	25ip	20ip	10sb	-	-	-	-	-	-	-	-	-	-	-	-	
5	Temp.	2.3	2.1	2.2	3.8	5.2	4.4	Ir	3.0	3.1	2.5	2.2	2.1	2.3	3.1	3.1	2.6	2.0	2.0	7.8	Killed
	Cond.	N	N	N	SA	SA	SA	SP	SA	S	SI	R	N	N	N	N	N	N	N	N	
	Treat.	-	-	-	20ip	20ip	25ip	10sb	10sb	5sb	-	-	-	-	-	-	-	-	-	-	
6	Temp.	1.5	2.6	2.6	2.8	2.0	3.4	4.5	4.0	2.4	1.8	1.9	3.0	1.9	2.6	2.4	2.7	2.5	2.6	2.7	+
	Cond.	N	N	N	N	S	SA	SA	SP	S	S	SI	I	I	I	R	N	N	N	N	
	Treat.	-	-	-	-	-	25ip	20ip	20ip	10sb	5sb	-	-	-	-	-	-	-	-	-	
7	Temp.	1.7	2.0	2.1	3.0	3.6	5.4	4.0	2.4	2.6	3.3	2.7	2.2	1.6	1.9	2.3	2.4	2.6	2.5	2.5	+
	Cond.	N	N	N	N	S	SA	SA	S	SI	SI	I	I	R	N	N	N	N	N	N	
	Treat.	-	-	-	-	-	25ip	20ip	10sb	5sb	5sb	-	-	-	-	-	-	-	-	-	
8	Temp.	2.1	2.1	2.3	3.1	4.0	5.9	Ir	1.0	2.0	2.5	3.3	2.9	2.0	3.4	3.3	3.3	3.0	3.5	2.4	+
	Cond.	N	N	N	E	S	SA	SP	SA	S	I	I	R	N	N	N	Ir	Ir	Ir	Ir	
	Treat.	-	-	-	-	20ip	25ip	10sb	10sb	10sb	5sb	-	-	-	-	-	-	-	-	-	
9	Temp.	2.2	1.9	2.0	2.9	2.3	4.4	1.0													
	Cond.	N	N	N	E	E	SA	SP	Dead												
	Treat.	-	-	-	-	-	25ip	20ip													
10	Temp.	2.0	2.0	2.0	1.9	3.6	4.8														
	Cond.	N	N	N	E	S	SA	Dead													
	Treat.	-	-	-	-	25ip	25ip														
Control Guinea Pigs - No Treatment																					
11	Temp.	1.4	1.9	2.1	2.0	1.7	4.3														
	Cond.	N	N	N	N	E	SA	Dead													
12	Temp.	1.6	2.5	3.1	3.6	3.6	4.5	5.0	3.0												
	Cond.	N	N	N	E	E	S	SA	SP	Dead											
13	Temp.	2.5	2.9	2.6	2.9	2.4	4.0	4.6													
	Cond.	N	N	N	N	E	SA	SA	Dead												
14	Temp.	1.4	2.1	1.6	2.4	3.0	4.4														
	Cond.	N	N	N	N	E	SA	Dead													

N - Normal
E - Excitable
Ir- Irritable
S - Visibly Sick
A - Ataxia
P - Paralysis
I - Improving
R - Recovered
+ - Virus Injected
Temp. F. last 2 figures above 100 shown

TABLE 1—EXPERIMENT 7
GUINEA PIGS TREATED WITH ANTISERUM WHEN VISIBLY SICK

the antisera. Neither the normal rabbit serum nor the supportive treatment yielded any therapeutic effect. As shown in Table 2, 41 guinea pigs were used as controls and of this number only one recovered from the disease.

In addition to the signs of Western equine encephalomyelitis shown by the guinea pigs at the time of treatment with specific serum, other evidence indicated the presence of the disease. In many instances the disease continued to progress even after the start of serum therapy, causing ataxia and in a few cases paralysis before recovery became apparent. In 34 per cent of the animals the disease continued to progress after treatment was begun, causing death. Histopathologic studies of tissues from the central nervous system were also made of animals that were killed after they had recovered from the disease following serum therapy. The results of these studies will be published elsewhere. Animals that recovered from the infection following treatment with serum were tested for immunity by intracerebral injection of the virus. Eighty-two per cent of those tested were found to be immune, show-

ing that the disease had progressed sufficiently in these animals to produce active immunity.

Olitsky, Schlesinger, and Morgan reported [6] that they were unable to detect immunity in guinea pigs 7 weeks after they were given serum following virus injection. We would like to point out however, that the animals that they tested for immunity were treated with antiserum in the early stages of the disease (the first febrile phase or the afebrile phase) resulting from pad injection of virus. Their findings are in agreement with ours [1]; namely, that guinea pigs did not become immune when they were treated with antiserum in the early stages of the disease (onset of fever) after intralingual virus injection.

The results of Experiment 7 are shown in Table 1. This is a sample protocol.

The summary of the results of these experiments is shown in Table 2. Fifty-five guinea pigs were treated with Western equine encephalomyelitis antiserum after they were visibly sick, and of this number 67.3 per cent recovered. Of the 41 control guinea pigs 40 died and one recovered spontaneously.

TABLE 2

Treatment of Guinea Pigs with Antiserum When Visibly Sick. Summary of Results

Exp. No.	*Titer of Antisera Units*	*Treatment When Visibly Sick* *	*Untreated Controls* *
1	1,000	3/4	0/4
2	1,000	5/6	0/6
3	700	5/8	1/3
4	500	7/12	0/10
5	600	5/9	0/9
6	500	4/6	0/5
7	800	8/10	0/4
Number recovered		37	1
Total animals used		55	41
Per cent recovery		67.3%	2.5%

* Denominator: No. animals tested; numerator: No. animals died.

Experiment 8—The guinea pigs in this experiment were treated with the purpose of confirming our preliminary observations that treatment with low potency serum is ineffective.[1] The serum used in this experiment was obtained by hyperimmunization of rabbits for 2 weeks, and its titer was only 1 unit per ml.

Each of the 20 animals was injected intralingually with 0.15 ml. of a 1–10 dilution of guinea pig brain virus. The guinea pigs were divided into 2 groups of 10 each, one used as controls and the other for treatment.

All of the animals in the experimental group developed the disease and were given serum treatment when they were visibly sick. The method of injection and the quantities of the serum used were the same as described in the previous experiments. Of the 10 animals treated only one recovered.

In the control group one guinea pig escaped infection, the other 9 developed the disease and died.

The results of this experiment indicate that an antiserum of low antibody content is of very little value in treating experimental Western equine encephalomyelitis.

TREATMENT OF RHESUS MONKEYS

Three experiments were performed with rhesus monkeys. The virus was inoculated by the intracerebral route in doses of 0.1 to 0.25 ml. of a 20 per cent suspension of chick virus. The animals were treated with serum by the intravenous and subcutaneous routes at the onset of fever which usually appeared from 24 to 48 hours after injection of virus. The only other signs that were detectable at this stage were roughened coats, irritability, and in two cases tremors. In the animals that recovered, however, the disease continued to progress after the administration of serum, producing tremors, ataxia, and in one case paralysis before recovery began. The monkeys that recovered received on the average about 475 ml. of serum.

Chart I illustrates the results of successful therapy of 2 monkeys with antiserum and of treatment of 2 control monkeys with normal rabbit serum.

In these experiments 11 monkeys were treated with serum at the onset of fever and of this number 6 died and 5 recovered. Ten monkeys were used as controls and all of them developed the disease and died. The animals that recovered following serum therapy were observed for 68 days and remained normal after recovery.

DISCUSSION OF RESULTS

The results of these experiments show that we have been able to treat experimental Western equine encephalomyelitis in guinea pigs and rhesus monkeys effectively with specific hyperimmune rabbit serum when treatment was begun after the former showed visible signs of the disease and the latter onset of fever. On the other hand, the results described in the literature indicate that most of the other workers have failed to prevent death in animals

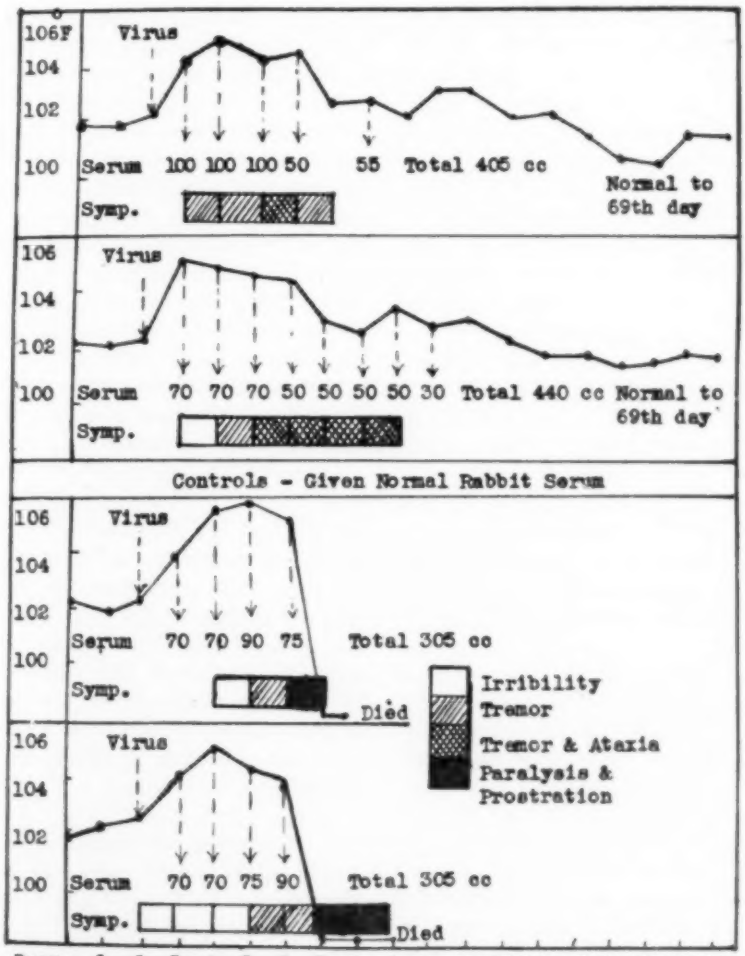


Chart 1. Experiment 4. Treatment of Rhesus Monkeys with Antiserum at Onset of Fever

with antiserum when treatment was begun after the onset of signs of encephalitis. As we have pointed out, however, most of their studies were carried out either with low potency serum or with inadequate quantities of serum. For example, in the treatment of guinea pigs, Traub [5] gave each animal 1 ml. of serum and Olitsky [6] 10 to 20 ml., while Wykoff and Tesar [3] treated monkeys at the onset of fever with 20 ml. of serum each. In addition, the animals in their studies were not given treatment in the true sense of the word. Serum was not given to the animals when it was needed but was administered to them on a time basis. They did not give supportive treatment to their animals in the form of forced feeding as was done in our experiments.

In our studies we were able to treat guinea pigs successfully after the onset of encephalitis or monkeys after the onset of fever only when adequate quantities of antiserum having a potency of 500 to 1,000 units per ml. were employed. On the average it was necessary to use 85 ml. of serum to treat a guinea pig and 475 ml. to treat a monkey. As shown in Experiment 8, antiserum of low potency (1 unit) was not effective in treating this disease. We also found that supportive treatment was a useful adjunct in treating the disease in animals with specific antiserum.

In our earlier studies [1] we observed that the *in vitro* neutralization method of determining the therapeutic value of Western equine encephalomyelitis antiserum was not reliable; that is, a serum that had a high neutralizing value was not always effective therapeutically. Later Traub [5] confirmed this observation. For this reason we have employed a passive protection test in mice to establish the therapeutic value of an antiserum. The potency of the serum is expressed in terms of mouse protective units per ml. as described under Serum Testing. In our experience, this test proved to be a reliable method of forecasting the therapeutic value of a given lot of antiserum. Usually sera that tested 500 units to 1,000 units were effective in treating the disease, those of lower potency were not.

Olitsky and his associates reported [6] that by 3 injections of virus in rabbits they were able to obtain an antiserum which was equivalent in potency to that obtained after 46 injections. In our experience however, an antiserum could be produced titering from 500 units to 1,000 units per ml. only after 12 to 16 weeks of hyperimmunization of rabbits.

Judging from the quantities of antiserum that it was necessary for us to use in order to obtain successful results in treatment, it appears that inadequate amounts of serum have been used by the other investigators. This together with the questionable potency of the serum they employed are in our opinion the greatest factors contributing to their unsuccessful efforts effectively to treat experimental Western equine encephalomyelitis with specific antiserum after the onset of encephalitis. Excepting for some of the antisera employed by Olitsky, et al.,[6] the potency of the serum used by the other workers cannot be compared to that of ours, either because they were unstandardized or because their antibody content was determined by a different method. However, judging from the methods used in the preparation of the sera by most of the other investigators, it is doubtful if their antisera equaled ours in potency.

SUMMARY AND CONCLUSION

Fifty-five guinea pigs (Table 2) were treated with specific hyperimmune rabbit serum of 500 to 1,000 units when they became visibly sick following intralingual injections of Western equine encephalomyelitis virus. Of this

number 67.3 per cent recovered. On the other hand, of the 41 guinea pigs used as controls, one recovered spontaneously and 40 died.

Serotherapy was less effective in rhesus monkeys, giving a recovery rate of 45.5 per cent against 0 per cent in the control group. However, these animals were treated with serum at the onset of fever following intracerebral injection of the virus. Since by this method of injection the virus produces a fulminating type of the disease which is obviously more difficult to treat, these results are considered significant.

A Western equine encephalomyelitis antiserum has been prepared by hyperimmunization of rabbits which is effective in treating the experimental disease even after the animals showed evidence of central nervous system involvement. It is believed that the successful treatment of the disease in these experiments, can be attributed to the use of adequate quantities of antiserum of high potency administered by a route which made the serum antibodies readily available to the animal.

REFERENCES

1. Zichis, J., and Shaughnessy, H. J. Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum. *J.A.M.A.*, 115:1071–1078, 1940.

2. Howitt, B. F. Equine Encephalomyelitis. *J. Infect. Dis.*, 51:493, 1932.

3. Wyckoff, R. W. G., and Tesar, W. C. Equine Encephalomyelitis in Monkeys. *J. Immunol.*, 37:329, 1939.

4. Davison, R. O. Encephalomyelitis in Saskatchewan, 1941. *Canad. Pub. Health J.*, 33:388–398, 1942.

5. Traub, E. Serotherapeutic Experiments in Induced Infection of Guinea Pigs with the Virus of American Equine Encephalitis. *Zentralbl. f. Bakt.*, 1 Abt., Orig., 147:81, 1941.

6. Olitsky, P. K., Schlesinger, R. W., and Morgan, I. M. Induced Resistance of the Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus. *J. Exper. Med.*, 77:359–374, 1943.

7. Gold, H., and Hampil, B. Equine Encephalomyelitis in a Laboratory Technician with Recovery. *Ann. Int. Med.*, 16:3, 1942.

Harmon General Hospital is Tropical Disease Center

Harmon General Hospital, Longview, Tex., was recently designated for the treatment of tropical diseases. The only other army tropical disease center is Moore General Hospital, Swannanoa, N. C. Lt. Col. Francis R. Dieuaide, Chief of the Tropical Disease Branch, Medical Consultants Division, Office of the Surgeon General, stated that the medical staff of Harmon General Hospital has for some time been engaged in a study of relapsing malaria which has resulted in a permanent contribution to the knowledge of the disease. The study is now being extended to other tropical diseases which are rare in this country, such as filariasis, schistosomiasis and dysentery. Col. Gouveneur V. Emerson is Commanding Officer of Harmon General Hospital, Lt. Col. Worth B. Daniels is Chief of the Medical Service and Lt. Col. Stuart W. Lippincott is Chief of the Laboratory Division.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35 August, 1945 Number 8

C.-E. A. Winslow, Dr.P.H., *Editor*
Leona Baumgartner, M.D., *Associate Editor*
Arthur P. Miller, C.E., *Associate Editor*
Mazÿck P. Ravenel, M.D., *Editor Emeritus*
Martin Frobisher, Jr., Sc.D., *Associate Editor*
James E. Perkins, M.D., *Associate Editor*
Augusta Jay, *Editorial Associate*

Editorial Board

Reginald M. Atwater, M.D.
Chairman, and Managing Editor
Ira V. Hiscock, Sc.D.
Kenneth F. Maxcy, M.D.
Henry E. Meleney, M.D.
Alton S. Pope, M.D.
C.-E. A. Winslow, Dr.P.H.

THE WAGNER BILL OF 1945

THE following letter was sent to the editor of this Journal (and to the editors of other journals in the health and medical field) by the Hon. Robert F. Wagner under date of May 31:

On Thursday, May 24, I introduced with Senator Murray a bill S. 1050, entitled: "The Social Security Amendments of 1945." The bill provides for "the national security, health and public welfare." Representative Dingell of Michigan introduced a companion bill (H.R. 3293) in the House at the same time.

I am forwarding the bill itself, and a copy of my speech in the Senate for your information and use.

I particularly invite your earnest study of the provisions of the bill relating to health. There is absolutely no intention on the part of the authors to "socialize" medicine, nor does the bill do so. We are opposed to socialized medicine or to State medicine. The health insurance provisions of the bill are intended to provide a method of paying medical costs in advance and in small convenient amounts.

During the formulation of this bill, we have benefited greatly from the constructive advice and suggestions of practicing physicians, and of physicians in clinical and teaching positions. Their constructive suggestions have resulted in changes in the bill which we presented in the last Congress. Undoubtedly other changes will be made before this bill is enacted into law. We wish to have it known that we invite constructive suggestions from the medical profession.

In addition, members of the medical profession will be given full opportunity to voice their opinions in open hearings when the bill is considered in Committee.

I hope that you will print this letter in your Journal and that you will join me in urging the medical profession to undertake an earnest study of the actual provisions of the bill. In this way you can help immeasurably in avoiding misunderstanding and misinterpretation of the legislation and in stimulating physicians and medical and hospital organizations to come forward with constructive suggestions and advice.

There has been some talk in the past about the failure of congressional leaders to consult with the professions concerned in regard to legislation on medical care. "Consultation" behind closed doors on the basis of deals between pressure groups would not be in the public interest. "Consultation" on the basis of intelligent open discussion on facts and policies is what Senator Wagner seeks. It is to be hoped that his request for counsel may be met on the same high plane, with factual and objective criticism and not with catch-phrases about "socialized

medicine" and nonsense about "the end of freedom for all classes of Americans." This will not be easy in the climate of passion and prejudice which the National Committee of Physicians for the Extension of Medical Service is attempting to create. We believe, however, that the members of the A.P.H.A., at least, will approach the subject in an intellectual rather than an emotional spirit.

The new bill is an omnibus measure of 185 printed pages which correlates and amends many sections of the present Social Security Act to provide a complete and logical program of medical care for the American people.

It includes a modified version of the Hill-Burton Bill for the Development through federal aid of essential hospital and health center facilities, particularly in rural areas. It then proceeds to basic public health services and presents a revision of Titles V and VI of the present Act, incorporating also the essentials of the present venereal disease and tuberculosis control programs. It modernizes existing policies of public assistance with regard to medical care. It then proceeds to set up a wide national program of contributory prepayment for medical care, based on a payroll contribution (one-half from the employee and one-half from the employer). To clarify certain widespread misrepresentations, it should be pointed out that this contribution for medical care amounts to 3 per cent of income, an additional 5 per cent being required for existing programs of retirement, survivors, and extended disability insurance, unemployment insurance, and temporary disability insurance. Also, it should be pointed out that the bill interferes in no way with voluntary hospitals or with the system of medical practice. "Health insurance is simply a method of paying medical costs in advance and in small convenient amounts." Finally, the bill proceeds to provision for the care and rehabilitation of disabled persons.

Aside from its much wider scope, this measure differs from the Wagner Bill of 1943 in its specific provisions for decentralization of administration and for community sharing of responsibility through national and regional Advisory Councils. In the health and medical field it is notable for its emphasis on quality of service and its provisions for assisting in basic research and in the training of personnel.

This measure is now placed before us for criticism. It is a challenge to the fair-mindedness and constructive imagination of the American people—and, particularly, of the members of our *Association*. The provisions for local administration are wisely drawn in flexible form; but they should be carefully checked with the generally sound policies outlined in the memorandum adopted by the A.P.H.A. last fall. It may be a source of regret to some that home nursing service is not provided in the basic insurance plan but left for later study, since many of us believe that the inclusion of such service would involve savings in hospital expense in excess of the costs of nursing.

These, and many other provisions of the bill, should be studied with meticulous care; and it would seem eminently wise for the *Association* to re-activate its Committee on Medical Care for a thorough-going analysis of the problems involved. This measure is probably more vital in its potentialities for the American people than any other item of domestic legislation now before the Congress or likely to come before the Congress for a decade.

As a preparation for such discussion we urge our members to study in detail the text of such parts of S. 1050 as relate to the health and medical field; and also to read Senator Wagner's introductory speech on "Social Security for the American People" delivered before the Senate on May 24, 1945.

"DIPHTHERIA REBOUNDS"

AN article under the above title by Knud Stowman[1] calls attention to a problem which may prove of direct significance to health administrators in the United States.

Fifteen years ago, diphtheria incidence in the various countries of Western Europe had reached a moderate and reasonably uniform figure, of 50–100 reported cases per 100,000 population. The decade following 1926 showed a decrease in most of these countries but a more or less steady increase in Germany. By 1937–1940, the incidence rate was below 20 in Denmark, the Netherlands, Norway, Sweden, and Switzerland; but it was 212 in Germany. Increasing mass movements of children to camps and neglect of immunization are the two main reasons advanced by Stowman to explain the phenomenon.

From 1939 on, a second disturbing factor appeared. The gravity of the disease began to show a marked increase. In 1937–1938 the German fatality rate was 3.8; in 1940, it was 5.8. Frequently, in spite of immediate and ample serum treatment, death occurred as a result of severe toxic action, often without membrane formation. Fischer recorded 64 per cent of a series of 123 cases showing interstitial myocarditis.

In 1941 the rise of the diphtheria rate in Germany was accelerated; and the disease in its new and virulent form spread in the occupied countries of Norway and the Netherlands with disastrous results. The incidence of diphtheria in the Netherlands rose 40-fold and in Norway 112-fold.

Stowman[2] estimates that there were at least 1,000,000 cases of diphtheria in Europe (outside of Russia). He rightly concludes that "diphtheria has turned out to be the leading epidemic disease of the war on the European continent both as a cause of morbidity and of mortality."

Germany is no longer isolated from us by a barrier of steel. Thousands of soldiers will return from that country or from contact with prisoners from that country. It will be somewhat surprising if some of them do not bring strains of this highly virulent diphtheria to our shores. It behooves us to redouble the strength of our immunization program.

On the whole, this program has been among the most creditable of all our efforts to promote the public health. Reports from the states show only 15,323 cases of diphtheria reported for 1944, lower than the median for 1939–1943. Of these 15,323 cases, however, California contributed 1,318, South Carolina, 1,547, and Texas, 2,031; against 330 for the State of New York. A word to the wise should be sufficient.

REFERENCES

1. Stowman, K. Diphtheria Rebounds. *Epidemiological Information Bulletin*, UNRRA Health Division. Washington, D. C., 1:157–168 (Feb. 28), 1945.
2. Stowman, K. The Epidemic Outlook in Europe. *Epidemiological Information Bulletin*, UNRRA Health Division. Washington, D. C., 1:101–111 (Feb. 15), 1945.

THREE "R's" OF ADMINISTRATION

ON a hot afternoon in June, three cronies were chatting over their highballs at the club. Dr. C. O. R. Dinator, the local Health Officer had started the discussion. "Had a hard day. In this weather you sometimes wonder what you're for and what it's all about. My job is administration, yes. But what is

administration? Is it just a mass of petty details? Saying yes or no to this question. Settling that minor squabble between bureau chiefs. Are there any general principles, any broad lines of policy that make a good administrator—or a bad one?"

"There's just one principle of good administration," said Col. R. U. Tine. "That's the clear fixing of administrative responsibility. We've found that out in the Army, and the fact that a lot of one-time civilians like myself have learned this lesson is a good thing for the nation. Lines of responsibility, 'channels,' that's the answer. Every man responsible to someone above him—and the whole pyramid ending in you. Each individual told clearly what he has to do, supported to the limit if he does it, given the works if he fails. So on, all the way down. If you stick to fixed channels of authority, the machine can work. There is nothing worse for any organization than to have a director going over the heads of bureau chiefs to deal with staff directly, to dictate details himself, leaving assistant administrators uncertain of their ground, and failing to support actions performed in good faith. Worse still is the policy of directors who countermand actions, or even reprimand an assistant in the presence of others. Such conduct shakes an organization structure. It is termitic in its effect."

"Good, but not good enough," said the eldest of the party, Professor B. Free, revolving his glass so as to make the ice tinkle pleasantly. "Of course you must have responsibility in any good organization. In 1918 when I wore a uniform myself, perhaps that was enough. We turned out men trained to march round and round in the mud and then hurled them in machine-like masses at the enemy. Discipline was the main factor then. This war is different. It is complex and technical and changing; and so is modern public health. Within rather broad limits of discipline, I think you'll own, Colonel, that you want men of individual initiative—men trained to think for themselves, to meet emergencies, to change and grow. Too much routine kills that initiative. Your bureau chiefs, or whatever you call 'em, Doctor, must be stimulated to a maximum of self-development, if you're a really good administrator."

"Right you are," said Dr. Dinator. "But the problem is not quite so simple. I want a disciplined group of free-wheeling bureau chiefs. But I want more than that. They must work as a team for a common end. I think coöperative planning is fundamental in effective management. Looking ahead, charting the program and goals in advance, is an indication of an expectation of progress. Having a goal implies purposeful endeavor. It counteracts a tendency to let down or coast within the groove of routine. It lays the groundwork for measurement, for the fulfillment of plans. And real planning cannot be confined wholly to those on the top rung of the ladder. The staff should be brought into planning. The nurse in the field, the inspector, the clerk at the desk have ideas. The bird and the worm have different vantage points and experiences. A plan handed down from the top is a foreign plan. A plan in which a staff has participated is their plan. There is inspiration and self propulsion to make one's own plan succeed.

"Naturally a director will have a larger voice in deciding on the main elements of a plan, for his scope and responsibility are greater. But the brick and the mortar and the framework should be drawn from the collective experience of the working team. I have often seen dictated plans founder through lack of understanding of their workability on the firing line. I think a director should dispense with the word 'my' and say 'our.'

"A staff conference in its true sense means a meeting in which people can confer and express themselves. It is not primarily the place for a director's speech or a harangue. Nothing kills staff initiative so quickly as a director monopolizing the chair and exhibiting an attitude that endorsement of his ideas only is expected, and that discriminating judgment is unwanted. The best service a staff member can render his superior within a conference is a frank statement of his beliefs. How much better is opposition within a closed conference, than open, sabotaging criticism later on the outside. I honor the voice of the man who differs with me in conference. His voice adds strength to the eventual plan decided on. Staff conferences are fundamental in good administration."

"Perhaps we're all right," said the Professor, setting down his empty glass with a regretful sigh, "and if we put the three ideas together we've got something. Responsibility, Room-for-Initiative, Relationship, mixed in proper proportions spell good administration. Good-night, boys. Tomorrow is another day."

REFERENCE

1. For an authoritative review of this aspect of administration see *The Elements of Administration*, by L. Urwick, Harper and Bros., 1944.

Legislating for Local Health Units

At the instance of the Association's Subcommittee on Local Health Units, the Conference of Commissioners on Uniform State Laws has undertaken to draft a model permissive or mandatory health unit law, the text of which will be submitted to and acted upon by its 1946 annual meeting. It will thus be available for the 44 state legislatures that will meet in 1947.

The principles suggested by the committee in the drafting of such legislation are:

1. Every part of the state should be provided with adequate and efficient local health service through the organization of county and district departments of health.
2. Existing local health boards should be abolished and their powers and duties transferred to the new county or district organization.
3. The new local health organization should serve a population large enough to support an adequate staff and conduct a complete program of work. Certain conditions should be met:
   a. The health district should correspond to some existing unit or combination of existing units; existing tax, appropriating, and auditing machinery must be utilized.
   b. The local governmental units making up the districts must contribute substantially to its support and have a substantial part in its control.
   c. The maintenance of a specified standard of service must be required for every unit and the state must contribute state aid to make this possible.
   d. Districts may be formed or dissolved or their boundaries changed by the state health board on the recommendation of the state health officer, but local interests should be given a hearing on proposed changes, or may themselves propose changes.
   e. Health officers and all other local unit employees should be under the merit system.
   f. The local health officer should be a physician, should serve full time, be trained in public health, and his appointment approved by the state board of health.
   g. The local health officer should be responsible for his own program, budget expenditures, and personnel under the general supervision of the state health authority.

Meat and Meat Products and Cereal Products*

Food and Nutrition Section

THE methods herein described are offered for consideration as tentative methods for the examination of certain products. It is realized that they are far from being complete and adequate for all types of work, but it is hoped that from time to time they will be supplemented with other methods, and refinements made of the ones here submitted. Any aid along this line will be greatly appreciated.

Tentative Methods for the Examination of Meat and Meat Products

In this report, for the sake of ease in handling, meat is divided into six rather broad types. Methods of handling, sampling, and examination are made on that basis, while the bacteriological media employed have been combined under one head in order that reference may be made to a specific medium without repetition.

General Considerations in Collecting and Handling of Samples

COLLECTION

Sample bottles, prior to use, shall be cleansed with great care, rinsed in clear water, dried and sterilized. Great care must be exercised to have the samples taken represent the meat items to be tested, and to see that no contamination or change occurs prior to the examination.

STORAGE AND TRANSPORTATION OF SAMPLES

Because of the rapid and often extensive changes which may take place in the bacterial flora of "bottled" samples when stored, even at temperatures as low as 45° to 50° F., the samples must be examined as promptly as possible after collection.

It is usually advisable to ship samples in special shipping containers refrigerated with dry ice rather than natural ice.

PREPARATION OF THE SAMPLE

The samples taken should be truly representative of the meat to be examined and should consist of several portions taken from different locations. The samples should be ground by passing through a food grinder to divide the product into fine particles in order that the bacteria located in all portions may be placed in solution. The samples, after placing in dilution bottles, should be shaken thoroughly to disperse evenly the meat and give a uniform suspension.

Shaking machines and grinding machines are very helpful in obtaining

* Report of the Committee on Microbiological Examination of Foods.
Committee on Microbiological Examination of Foods.
Organized 1932. Published reports: *Year Books*. 1935–1936, 1937–1938, 1941–1942, *A.J.P.H.*, June, 1943.

uniformity of results. Sterile broken glass and other agents are very helpful in obtaining uniform suspension for plating.

1. Fresh Uncured Meats (beef, pork, lamb, veal, hamburger, etc.)—

Ten to twenty small portions of meat are taken aseptically from the meat to be examined and placed in a sterile wide mouth sample bottle. The sample should weigh at least 50–75 gm.

Grind in sterile small meat grinder, and weigh 10 or 11 gm. of ground meat into dilution water (10 gm. if 90 ml. water blank and 11 gm. if 99 ml. water blank is used). The first dilution bottle is shaken 3 minutes in a standard shaking machine or 100 shakes by hand, and then the desired dilutions made in the ordinary manner.

For total bacterial count, plate with nutrient agar [1] and incubate 72 hours at 20° C. North gelatin agar [7] plates may also be used. For the enumeration of specific types of bacteria differential media may be used. The 20° C. incubator temperature is used, since fresh meat is kept under refrigeration and best results will be obtained if the lower temperature of incubation is used.

2. Hams—

a. Ready to eat, boiled, delicatessen, etc.

Take samples from the outside flesh portion of the hame after removing about ½ in. of the outside meat, and from areas around the articulations of the tibia and femur.

Prepare sample as described above under Fresh Meat.

For total bacterial count, use nutrient agar [1] or North gelatin agar [7] plates. Incubate for 48 hours at 37° C. and count the total number of bacteria and note numbers of *Staphylococcus aureus*.

For total Staphylococcus count, use blood agar [3] plates.

Incubate for 48 hours at 37° C.

For poor binding in boiled hams, use nutrient gelatin [2] plates and count the gelase producers after three days' incubation at 20° C.

For green discoloration of hams use blood agar,[3] benzidene blood agar,[6] or North gelatin agar [7] plates.

Incubate for 2–4 days at 37° C. and count the oxidizing bacteria. Use Cystine broth,[4] incubated 2–4 days at 37° C. to indicate sulfide-forming bacteria.

b. Sweet Pickle Smoked Hams

The most important defect to determine in smoked hams is ham souring. The points of souring may be divided into six general areas:

a. "Shank Sour" or sour tibial marrows
b. "Body Sour" or sour meat
c. "Aitch Bone Sour" or souring of the os pubis remaining in the ham
d. "Stifle Joint Sour" or souring of area around articulation of femur and tibia-fibula
e. "Body Bone Sour" or sour femur marrow
f. "Butt Sour" or sour in butt between aitch bone and muscle.

In order to locate source of trouble, samples should be taken in these areas.

For aerobic bacteria causing ham souring, use North gelatin agar.[7] Emulsify bone marrow, tissues, pickle, etc., in the agar while held at water bath temperature of 42° C. Incubate plates at 20° C. and 37° C. and look for members of the genera: *Achromobacter, Bacillus, Pseudomonas, Proteus, Serratia,* and *Micrococcus.*

For anaerobic bacteria causing ham souring, use meat and samples of pickle, marrow, tissue, scrapings, etc., as indicated. Heat sample to 80° C. for 20 minutes so that only viable spores remain. Use glucose-brain-broth [5] and peptone colloid medium (Difco special formula), and incubate for 2 days at 20° C. and 37° C. Look for *Clostridium putrefaciens* and other clostridia.

3. Bacon

Grind sample as indicated under Fresh Meat.

For total bacterial count use nutrient agar [1] or North gelatin agar [7] plates incubated for 48 hours at 20° C. Count the colonies and then flood the plate with a 0.4 per cent aqueous solution of tetramethylparaphenylenediamine-hydrochloride (Eastman) so that colonies are just covered with the solution, and observe until no more colonies take on a purple color. Count the purple colonies and record as "oxidizers."

For H_2S forming bacteria, pour blood agar [3] plates and incubate for 2 days at 37° C. in 5 per cent CO_2 or H_2 or under partial vacuum in a standard anaerobic jar. The plates should be poured one-half to two-thirds full. Count the embedded green colonies and record as H_2S forming bacteria. Bismuth sulfite agar (Difco formula) may be used as a plating medium and incubated for 2 days at 37° C. The black colonies are sulfide formers.

For gum formation in bacon during curing, use Nutrient agar [1] or North gelatin [7] agar plates, to which 1 per cent sucrose, 0.05 per cent sodium citrate, 0.075 per cent sodium nitrate and 0.1 per cent glycerol have been added. Incubate for 7 days at 20° C.

If only the presence or absence of H_2S forming bacteria is desired, use cysteine broth [4] tubes and incubate 2 days at 37° C.

4. Sausage

In sampling, five or six frankfurters or a 4 to 5 in. section of bologna, meat loaf, etc., should be taken as representative samples. The sample should be taken aseptically from the inside meat. In preparing the sample, consideration should be given to the nature and consistency of the samples. Bologna, meat loaves, etc., resist disintegration during shaking and consequently it is necessary to grind or cut into very small pieces in order to obtain a representative analysis. If sample does not break up rapidly, it should be shaken more than the standard 100 shakes by hand. The amount of shaking can best be judged by the thoroughness of the dispersion in the water blank. The same type of sample should always be given the same kind of treatment in order to obtain comparable results.

For total bacterial count, employ Nutrient agar [1] or North gelatin agar.[7] Incubate for 2 days at 37° C.

5. Jellied Meat Products

The sample is obtained and prepared as under other types of meat. The weighed sample or the first water blank should be warmed to melt the gelatin and obtain good dispersion.

For total bacterial count, use Nutrient agar.[1] Incubate for 2 days at 37° C., and in addition to the total count, observe the number of Staphylococcus colonies.

6. Dehydrated Meat

Sample should be treated the same as for other meat products. The dried meat sample should be weighed into the water blank and shaken thoroughly. It will rehydrate quickly. If very fat, the blank may be warmed slightly in order to obtain better dispersion. Make total bacterial count using Nutrient agar.[1] Incubate 2 days at 37° C.

MEDIA TO BE USED

1. Nutrient Agar—

Prepared and used according to A.P.H.A. *Standard Methods*.

2. Nutrient Gelatin—

Prepared and used according to A.P.H.A. *Standard Methods*.

3. Blood Agar—

Blood agar base Nutrient agar base may be used for blood agar. Obtain

whole blood aseptically from sheep, and defibrinate with glass beads as it is drawn from the jugular vein. The defibrinated blood is tubed aseptically in sterile culture tubes for storage at refrigeration temperatures. The melted agar base is cooled to 45° C. and the whole sterile sheep's blood added in 10 per cent amounts. If chocolate agar is desired (for differentiating H_2S forming bacteria from oxidizing bacteria), add 5 per cent whole sterile sheep's blood to the agar base held at 90° C. Mix thoroughly, avoiding the formation of bubbles, and pour into plates if streaks are to be made. If pour plates are desired, cool to 45° C. and pour in thin layers. This is necessary since the medium is opaque, and, if thin, most colonies can be counted. Green colonies indicate peroxide producing bacteria, while sulfide producers do not react.

4. Cystine Broth—

To nutrient broth add 0.1 per cent of l-cystine and tube one-quarter full in ordinary culture tubes. Sterilize at 15 lbs. for 15 minutes.

Cut strips of filter paper and saturate one end of each strip in saturated lead sub-acetate solution to which a little glycerol has been added.

After inoculating the cystine broth in regular serial dilutions, insert the lead sub-acetate paper into the tube in such a way that it is held in place above the solution by the cotton plug. It must not come in contact with the liquid. Incubate at 37° C. for 24–48 hours. The blackening of the paper indicates hydrogen sulfide production.

5. Glucose-Brain-Broth—

Add 5–10 gm. of fresh sheep brains (gray matter only) to large culture tubes (1 x 8 in.).

Cover the tissue with about 30 ml. of glucose broth and sterilize for 25 minutes at 15 lb. pressure.

The glucose broth is made as follows:

Peptone	10 gm.
Beef extract	5 "
NaCl	5 "
Glucose	5 "
Water	1,000 ml.

6. Benzidine Blood Agar—

Add to regular blood agar 10 per cent of a 0.5 per cent solution of benzidine in 85 per cent sodium chloride. The purest grade of benzidine is necessary in order not to darken the blood.

7. North Gelatin Agar—

This is a Difco modification of North's medium. It consists in dehydrated form of:

Infusion from veal	500 gm.
Proteose-Peptone	20 "
Gelatin	20 "
Soluble starch	10 "
Isoelectric Casein	2 "
Sodium Chloride	5 "
Agar	15 "

Seventy-seven gm. of this mixture is suspended in 1,000 ml. of distilled water, adjusted to pH 7.3 and autoclaved 20 minutes at 15 lb. pressure.

Tentative Methods for the Examination of Cereal Products

The term, cereal products, covers a wide field for it may be considered to include all cereal products from the unmilled grain to any manufactured products in which cereal products are significant ingredients. However, in this report the term is restricted to its more common usage, that of food products consisting essentially or wholly of materials obtained from milled grain. Even this list is long and calls for a variety of bacteriological pro-

cedures which this preliminary report makes no pretense of adequately covering.

In addition to the usual bacterial counts of cereal products it is also frequently desirable to determine the numbers of specific types of organisms present as Tanner [1] has emphasized. For example, it is important for a canner to know whether spoilage organisms are present in the cereal products he uses, and if so the types present. In the baking and milling fields, for example, Amos and Kent-Jones [2] and Hoffman, *et al.*[3] have shown the significance of rope-producing bacteria. As Tanner [1] has pointed out, public health officials may be concerned at times as to whether pathogenic or food poisoning bacteria may be present in cereal products.

PREPARATION OF SAMPLE

Since most cereal products are insoluble in water the preparation of suitable dilutions for inoculating Petri plates offers a problem. Generally speaking in order to obtain uniform and accurate results it is necessary to use comparatively large samples and to have them in a rather finely divided state, e.g., like flour or meal. In dry or solid materials, such as cereal products, distribution of the bacterial population is frequently not uniform, hence the necessity of testing comparatively large amounts to obtain fairly representative samples.

The smaller the particle size of the material the greater the chance of bacteria will be exposed and washed off into the dilution water. This process is aided by the abrasive action of sand, glass beads, etc., incorporated in the dilution blank.

If the sample is in the form of a flour it may be used without treatment. If the sample is coarse the particle size of the representative sample should be reduced to approximately that of a coarse meal by grinding, with aseptic precautions, in a sterile mortar and pestle.

BACTERIOLOGICAL METHODS

1. *Total plate count*—

After thoroughlly mixing the prepared sample, weigh aseptically a 10 gm. sample in a sterile aluminum boat or on a piece of sterile paper. Transfer the sample to a dilution bottle fitted with a solid stopper and containing 90 ml. sterile water and 10 gm. of purified sterile sea sand. (The type of bottle and stopper recommended are those specified by "Standard Methods" [4] which also illustrates a suitable weighing boat.[5] Shake vigorously for at least one minute. Allow to stand for two or three minutes until most of the solids have settled to the bottom.

From the supernatant fluid of this primary dilution inoculate the 1:10 plates and prepare serial dilutions in multiples of ten in the usual manner. Plates are inoculated from each dilution. Pour the plates using Tryptone Glucose Extract Agar, of the following formula (dehydrated agar may be used), and observe the general precautions given for the pouring of plates in Standard Methods [4]:

Bacto-Tryptone	5 gm.
Bacto-Dextrose	1 "
Bacto-Beef Extract	3 "
Bacto-Agar	15 "
Distilled water	1,000 ml.
Final pH 7.0	

Incubate the plates at 35–37° C. for 48 hours and count the colonies. Report the results as the bacterial plate count per gm.

2. *Thermophilic Count*—

This count is made in the same manner as for total plate count except that the plates are incubated at 55° C. for 48 hours. It is desirable to determine the 37° C. and 55° C. plate counts of a sample at the same time as thereby some indication is obtained

whether the thermophiles are obligate or facultative. Report as thermophilic plate count per gm. of cereal product.

Another method for making thermophilic counts is by use of the Reeves Medium.

PREPARATION OF REEVES MEDIUM

1. Make a broth according to the following formula:

Peptone	10 gm.
Beef extract	5 "
Dextrose	5 "
NaCl	5 "
Distilled water	1,000 ml.

Warm the water to dissolve the ingredients and adjust to a pH of 7.0-7.4 with N/1 NaoH approximately 3 ml. per liter will make the adjustment.

2. Prepare the following and grind in food chopper obtaining a fairly uniform mixture:

Lung tissue	40 gm.
Spleen	7 "
Heart muscle	20 "
Brain (sheep or calf gray matter)	10 "
	20 "
Soy grits	3 "

To each 100 gm. of this mixture add approximately 50 ml. of the above broth and mix thoroughly to make a slurry. Tube this mixture in 1 x 8 in. test tubes (preferably screw cap) to a depth of about 2 in., using a wide stem funnel or by the use of a large pipette. The above broth is then added to an additional depth of 3 in. Into this test tube is placed a small inverted test tube supported on an aluminum wire of sufficient length to maintain the bottom of the tube above the level of the meat but well below the top of the liquid level. This is to prevent the mouth of the gas tube from becoming plugged and allows gas formation to be recorded. Screw caps or very tight plugs are necessary to prevent excessive evaporation upon incubation. Autoclave at 15 lb. pressure for 45 minutes to insure sterility.

USE OF REEVES MEDIUM

Weigh sample aseptically into sterile 99 ml. water blank and make serial dilutions in the ordinary manner. From each of the serial dilutions make inoculations into the tubes of Reeves medium which have previously been warmed in a water bath at 55° C.

Incubate at 55° C. for 4 days. Note the formation of gas in the small tube in each dilution and report as gas-forming thermophiles per gm. If there is no gas determine non-gas-forming thermophiles by making a slide from the supernatant liquid of each dilution, stain and observe types of bacteria under the microscope. This is necessary since turbidity cannot always be relied upon in determining growth.

3. *Thermophilic Anaerobes Producing H_2S*—

Test for these organisms by the method outlined by the National Canner Association.[7]

4. *Mold Count*—

This count is made in the same manner as the 37° C. plate count except that plates are poured with Malt Agar, pH 5.5 (dehydrated agar is recommended) and the plates are incubated at room temperature (25° C.) for 4 days. Count the mold colonies developing on the plates and report as the mold plate count per gm. of product.

An alternate medium is Potato Dextrose agar as given in *Standard Methods for the Examination of Dairy Products,* 8th ed. 1941, page 112.

5. *Method of Counting "Rope" Spores in Cereal Products*—

This method is essentially that of Amos and Kent-Jones.[2]

Two different dilution blanks are used; 400 ml. of 0.5 per cent NaCl, containing 20 gm. of clean sea sand, in a rubber stoppered 16 oz. bottle, and 100 ml. of 0.5 per cent NaCl in a rubber stoppered dilution bottle. Sterilize by autoclaving for 30 minutes at 20 lb. pressure.

The test medium is made by dissolving 10 gm. Bacto peptone, 5.4 gm. Bacto beef extract and 9 gm. sodium chloride in 1 liter of distilled water and adjusting the pH to 7.2–7.3. This broth is distributed in 5 ml. amount in test tubes 5/8 in. diameter, plugged with cotton and sterilized by autoclaving for 30 minutes at 20 lb. pressure (126° C.).

Weight 20 gm. of cereal aseptically

and transfer it to the 16 oz. dilution blank and shake vigorously for 2 minutes. This constitutes the primary suspension.

From the primary suspension inoculate 1 ml. and 2 ml. amounts respectively into tubes of the test medium. Then, after reshaking, transfer aseptically 20 ml. of the primary suspension to the 100 ml. dilution blank and shake this bottle vigorously.

From this second dilution inoculate aseptically tubes of the test medium with 4, 3, 2.5, 2, 1.7, 1.5, 1.3, 1.2, and 1 ml. amounts respectively. The bottle is shaken once or twice before the withdrawal of each of the above quantities.

Each tube is taken individually, the contents thoroughly mixed, and the tube *at once* placed in a bath of boiling water so that the level of the water is above the level of the liquid in the tubes. An Arnold steamer may be used instead of the water bath, provided it does not wet the cotton plugs of the tubes. The tubes are kept in the boiling water, or flowing steam in the Arnold, for 20 minutes. On removal of the tubes from the bath, or the steamer, their contents are thoroughly mixed and they are then incubated at 37° C.

The contents of the tubes are well mixed three or four times during the first 24 hours of incubation. At the end of 48 hours' incubation the tube in which a pellicle has grown on the surface of the broth is recorded as positive. The number of rope spores per gm. is taken as the reciprocal of the smallest fraction of a gram of flour giving a positive result.

If, as sometimes happens, a negative result is obtained with a quantity of flour greater than the smallest amount giving a positive result, then the number of spores per gm. is taken as the reciprocal of the quantity next greater than the smallest amount giving a positive result.

The quantity of cereal corresponding to the various inocula used are:

2	ml.	primary	susp.	= 1/10	gram	cereal
1	ml.	"	"	= 1/20	"	"
4	ml.	20:100	dil.	= 1/30	"	"
3	ml.	"	"	= 1/40	"	"
2.5	ml.	"	"	= 1/48	"	"
2	ml.	"	"	= 1/60	"	"
1.7	ml.	"	"	= 1/70	"	"
1.5	ml	"	"	= 1/80	"	"
1.3	ml.	"	"	= 1/92	"	"
1.2	ml.	"	"	= 1/100	"	"
1	ml.	"	"	= 1/120	"	"

If the cereal contains more than 120 spores per gm. higher dilutions are prepared and the corresponding inoculations made.

Amos and Kent-Jones [2] emphasize several precautions. One is the heat resistance of the spores. In this connection it is well to sterilize, by autoclaving, the tubes of inoculated test medium and the dilution blanks after they are used and before they are washed to prevent spreading these spores.

Another is the possible confusion between "rope" and other organisms. *Bacillus subtilis* is an organism which sometimes occurs in cereal and, if present, will form a pellicle on the broth. Since experiments have shown that this organism does not turn bread ropy, it may be advisable, when the spore count is high, to determine whether the pellicles are due to this organism and not to those of the *mesentericus* group. A quick way of doing this is to prepare agar slant cultures from the pellicles; the form of resulting growth will indicate which bacteria are present. *Bacillus mesentericus vulgatus* forms a greyish-white growth which is at first moist and "blister"-like in appearance, but later becomes drier and finely wrinkled. *B. subtilis* gives a whitish, spreading growth, the edges of which, viewed under a low power, appear as an interwoven mass of fine hairs.[2]

Those authors [2] consider it advisable

always to prepare duplicate sets of tubes. Often the two sets do not yield the same figure but they consider that the results obtained are satisfactorily consistent.

6. *Gas Forming Bacilli*—

If cereal products are to be used in processed foods containing nitrates, such as bologna, meat loaf, certain canned meats, etc., they should be tested for gas-forming bacilli.

In making this test use Jensen's Pork-Sucrose-Nitrate Medium.[6] In making the inoculations from the serial dilutions use 1 ml. pipettes and introduce the inoculum at the bottom of the medium in the tube being careful not to introduce or to allow entrapped air bubbles to remain in the medium. Incubate at 37° C. for 2 days. Gas production should start in 24 hours. If incubated at 49° C. more rapid gas-formation will be obtained.

7. *Detection of Flat Sour Spores*—

Test cereal products for the presence of flat sour microörganisms by the National Canners Association method.[7]

REFERENCES

1. Tanner, F. W. *Microbiology of Foods* (2nd ed.). Garrard Press, Champaign, Ill., 1944, pp. 693-722.
2. Amos, A. J., and Kent Jones, D. W. The "Rope" Spore Content of Flour and Its Significance. *Analyst*, 56:572–586, 1931.
3. Hoffman, *et al. Indust. & Eng. Chem.*, 29: 464–467, 1937.
4. *Standard Methods for Examination of Dairy Products* (8th ed.). American Public Health Assn., New York, 1941, pp. 18–19.
5. *Idem.*, p. 170.
6. Report of Committee on Standard Methods for Microbiological Examination of Foods. "Microbiological Examination of Spices, Fermented Foods and Fruit Juices." *A.J.P.H.*, 33, 6:726 (June), 1943.
7. *Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists*, 5th ed., 1940, p. 642.

HARRY E. GORESLINE, PH.D., *Chairman*, Office of Marketing Service, Chicago 3, Ill.
M. THOMAS BARTRAM, PH.D.
JAMES A. BERRY
EDWIN J. CAMERON, PH.D.
JOHN L. ETCHELLS, PH.D.
JAMES E. FULLER, PH.D.
MATTHEW E. HIGHLANDS
LLOYD B. JENSEN, PH.D.
CARL S. PEDERSON, PH.D.
PAUL S. PRICKETT, PH.D.
JOHN M. SHARF, PH.D.
EVAN WHEATON, PH.D.
OSCAR B. WILLIAMS, PH.D.

Bureau of Medical Services in Maryland

The Maryland State Board of Health has been authorized to create a Bureau of Medical Services under the provisions of a law which became effective June 1. The bureau will administer a program furnishing medical care for indigent and medically indigent persons and will conduct and operate the chronic disease hospitals to be constructed in the post-war period. A Chief of the Bureau will be nominated under the merit system by the Director of Health. A Council of Medical Care will be established by the State Board to assist in formulating policies connected with the medical care program.

Examination of Frozen Desserts and Ingredients*

Laboratory and Food and Nutrition Sections

THE work of the committee during 1943–1944 can be summarized briefly because the activities were curtailed under wartime conditions. A well attended two day joint meeting of the committee with the Standard Methods Committee on Milk and Milk Products was held in New York on May 5 and 6, 1944. A manuscript revision of the text of the 8th Edition of *Standard Methods for the Examination of Dairy Products* that had been prepared by Dr. A. H. Robertson was discussed at that meeting preliminary to the preparation of the 9th Edition of that report. The purpose of a revision of the entire text prepared by one individual was the elimination of inconsistencies between directions as written by different referees, but care was taken not to change the directions themselves.

Some very worth while suggested changes in the manner of presenting the material on frozen desserts in the 9th Edition of Standard Methods were proposed by the joint committee and an improved reference system was suggested. Rearrangements of the text will provide for convenience of users of the volume by placing related methods together regardless of whether they are used in the examination of frozen desserts or other dairy products. An example is a proposed section of the book to include all sediment testing methods. A subcommittee of the referees concerned is attempting to develop greater uniformity for sediment testing procedures. Likewise, it was voted to organize a separate section in the forthcoming volume devoted entirely to "screening" methods. While screening methods serve as "Rapid Survey Procedures," they do not have unqualified approval for indiscriminate use. Work was undertaken to secure uniformity of directions in the forthcoming edition with the next edition of *Standard Methods for the Examination of Water and Sewage*. It was brought out that extensive work is known to be in progress on the examination of eggs that should be given consideration by the committee, and also that the present volume lacks a method for the examination of stabilizers. The Referee for the Bacteriological Examination of Ingredients of Frozen Desserts was requested by the joint committee to expand the sections on methods for examining eggs and gelatin so that the latest forms of these methods will be available for the new edition.

Milton E. Parker, a member of the committee, appointed from the Food and Nutrition Section, has very recently found it necessary to resign from the committee. He has served on the committee for several years and, with the assistance of the Associate Referees working under him, prepared the section

* Report of the Joint Standard Methods Committee.

STANDARD METHODS COMMITTEE ON FROZEN DESSERTS AND INGREDIENTS

Organized 1937. Published reports: *Year Books* 1937–1938, 1938–1939, 1939–1940, 1940–1941, 1941–1942, *A.J.P.H.*, May, 1943.

on Sediment Testing of Frozen Desserts and Ingredients Used in Frozen Desserts, that appeared in the 8th Edition of the Standard Methods report. Mr. Parker's resignation is accepted with regret.

It is suggested that the committee be continued as work is in progress on the revision of the methods for analyzing frozen desserts to be published in the 9th Edition of *Standard Methods for the Examination of Dairy Products*.

FRIEND LEE MICKLE, Sc.D.,
Chairman, Joint Committee,
State Department of Health,
Hartford, Conn.

Representatives from the Laboratory Section
FRIEND LEE MICKLE, Sc.D., *Chairman*
JAMES A. GIBBARD
A. H. ROBERTSON, PH.D.

Representatives from the Food and Nutrition Section
F. W. FABIAN, PH.D., *Chairman*
M. E. PARKER
J. H. SHRADER, PH.D.

Associate Referees
M. T. BARTRAM, PH.D.
PAUL A. DOWNS, PH.D.
H. H. HALL
F. LESLIE HART
P. S. LUCAS
W. H. MARTIN
PAUL S. PRICKETT, PH.D.
B. E. PROCTOR, PH.D.
M. J. PRUCHA, PH.D.
E. C. THOMPSON, PH.D.
P. H. TRACY, PH.D.

Patients on Hospital Ships Now Get Whole Milk

A new method of quick-freezing whole milk is now making it possible to serve wounded soldiers returning from overseas on Army hospital ships with glasses of the beverage as appetizing and as tasty as any to be had on the farms of America.

Although in some instances the milk has been kept in the frozen state for three months, its taste is as fresh as if it had just come from the cow and the bacterial count is lower than that in the milk supply of the average American home. This important addition to the diets on the hospital ships resulted from a series of researches carried out by the Veterinary Division of the Office of the Surgeon General.

Brigadier General R. A. Kelser, Director of the Division, said that his research workers soon found that if milk were frozen slowly there was a tendency for the fat to be thrown out of emulsion and precipitated so that the milk was broken down into its constituent parts and proved unsatisfactory when thawed out. However, if the milk were frozen with extreme rapidity, it froze in very tiny crystals. As a result, when thawed out, it was found to be in its original condition.

Examination of Germicides and Antibacterial Agents*

Laboratory Section

THE Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents comprises separate progress reports from the several Referees and Associate Referees.

STUART MUDD, M.D., *Chairman*, University of Pennsylvania, Philadelphia

Chemical Antiseptics

In the preliminary work on the development of methods for testing antiseptics during the past year, two of the Associate Referees, G. G. Slocum and W. A. Randall, have studied a group of media to determine their efficacy in the *in vitro* testing of antiseptics. Through the courtesy of one of the peptone manufacturers we were supplied with nine batches of peptone, all of which, from the standpoint of the manufacturer, were as nearly identical as it was possible to produce. These peptones have been carefully studied to determine whether, when used in a test medium, they were capable of maintaining the resistance of *Staphylococcus aureus*, and also whether there was any variation from one peptone to another. Similar studies have been made by the Referee and Associate Referees on chemical disinfectants. The results of the studies indicate definitely that there was a marked difference in the ability of these peptones to maintain the resistance of *S. aureus*, and that there was definite variation from one peptone to another. Work is now under way in which tests are being made of peptones produced by the digestion of casein. Preliminary studies appear to indicate that such peptones may help in a solution of the problem concerning the development of a medium which is uniform and reproducible.

A preliminary method has been developed to determine the efficacy of germicides in the destruction of spores related to those preparations offered for use for cold sterilization of surgical instruments. One of the Associate Referees, Dr. J. D. Brewer, has devised a hinged joint which is similar to the joint in scissors. It has a closure of a few thousandths of an inch and probably represents the most difficult of all surgical instruments to sterilize. The technique of test would be, in general, to contaminate this hinged joint with spores in whole blood by allowing the blood suspension of spores to flow into the joint by capillary action and coagulate. After subjection of the joint to the chemical agent under test it would then be transferred to a tube of testing medium such as thioglycollate medium. The scissor joint has attached to it a circular loop to facilitate handling. These surgical joints can be made to hold to a tolerance of a few thousandths

* Committee authorized 1941. Published Reports, *A.J.P.H.*, May, 1943, and Aug., 1944.

of an inch and seem to represent a reasonably accurate reproduction of the joints of instruments which are not completely accessible to scrubbing with a brush before immersion in a "sterilizing" fluid.

The referees involved in the investigations dealing with antiseptics and disinfectants have worked closely together during the past year and because of their common interests will continue to do so.

HENRY WELCH, PH.D., *Referee*

Chemical Disinfectants

Unprecedented advance in the development of germicides has taken place in recent years. The standardized methods which were dependable for evaluating coal-tar, cresylic and pine oil types of disinfectants are not adequate as measures of proficiency for the variety of chemical germicides in current use.

It was pointed out in last year's report on this subject that one of the principal difficulties interfering with the adaptation of standardized testing methods lies in the exaggerated effect that slight differences in the test culture may have in the testing of certain types of the newer compounds. One of the primary causes of variations in test cultures is the culture medium. During the year the subcommittee compared the phenol coefficient results on five widely different chemical compounds obtained by using the regulatory F.D.A. medium and a promising brand of dehydrated medium developed specifically for disinfectant testing. The study was significant for the wide variation of results obtained by the qualified and experienced operators. As might be expected, the most uniform figures were obtained with a fortified coal-tar preparation and sodium ortho phenyl phenate while the most diverse resulted from the tests on a halogenated synthetic phenol. One operator obtained widely different phenol coefficient figures by culturing the test organisms in media made from different batches of regulation peptone. This collaborative effort emphasized the need for a consistent and uniform culture medium for use in testing germicides. However, production lots of peptone are likely to vary in their nutritive properties; and in fact, collaborative work in the Antiseptic and Disinfectant Subcommittees together with the kind coöperation of one of the leading culture media producers demonstrated the difficulty of reproducing this material exactly.

Solution of this problem consequently lies in the use of a synthetic or semi-synthetic medium or in an available stock pile of composite batches of peptone sufficiently large to supply germicidal testing laboratories over a substantial period. One of the collaborators of this committee, Dr. D. A. Wolf, has succeeded in producing a semi-synthetic medium of considerable promise for the production of test cultures. Also experimental evidence has been accumulated within the committee that a tryptic digest of casein, supplied by Sheffield Farms, a subsidiary of National Dairies, under the name of N-Z Case, is a satisfactory and consistent medium for the production of test cultures of both *Eberthella typhosa* and *Staphylococcus aureus*. This constituent produces a satisfactory culture medium without the use of beef extract, thereby eliminating an additional source of variation. It is understood that this product can be produced in sufficiently large quantity to allow a satisfactory and uniform composite stock supply.

Neither of these two media has been subjected to collaborative study by the committee, although the casein digest has been found by one of the committee members to equal the best available peptone as an ingredient for satisfactory subculture medium.

It has become increasingly apparent and is now well recognized that no single laboratory test of the coefficient-drop type can supply adequate information concerning the proficiency of a germicide in practical use. On the other hand, the need for reliable means of comparing potential germicidal quality is urgent. Present activities of this and closely related committees are being devoted toward refining and modifying available methods with this end in view. Sources of variation in a biological test may be intricate, and must be eliminated one by one, consequently spectacular progress in revising and developing a standardized reference test for germicides should not be expected.

CHARLES M. BREWER, *Referee*

Antibiotic Agents

The great potentialities of penicillin for combating a number of infections caused by Gram-positive bacteria and a variety of other diseases, notably gonorrhea and syphilis, led to tremendous interest in the production and utilization of this antibiotic substance, that by far overshadowed the interest in all the others combined. The great advantages of penicillin as a chemotherapeutic agent comprise its activity against aerobic and anaerobic Gram-positive bacteria; its relatively low toxicity to animals; the inability of blood, pus, and other body fluids to prevent its antibacterial action; its activity upon sulfonamide-resistant strains of bacteria. However, penicillin also has certain limitations, chief of which are, its relative instability against chemical and biological agents, the adaptation or increasing resistance of sensitive bacterial strains to its potency, and its limited activity against Gram-negative bacteria, fungi, and other disease-producing agents.

The investigations carried out thus far on penicillin can be divided into several categories:

1. Isolation and selection of more active penicillin-producing strains of *Penicillium notatum* and *Penicillium chrysogenum* from different substrates, to replace the less potent strains now in use; several new strains were thus obtained; the yields of penicillin obtained from each strain were found to vary depending on the nature of the substrate and the conditions of culture, such as surface growth vs. submerged and agitated growth.

2. Studies of the nutrient requirements and conditions of culture favorable to the production of penicillin; whereas at first the stationary method was most prevalent, gradually the growth of the penicillin-producing strains in deep tanks in a submerged and agitated state began to replace the stationary procedure; certain other methods, such as the use of bran as a medium, the trickling filter, the use of soft agar, as well as the surface liquid culture, are still in use for the growth of the organism and the production of penicillin.

3. Methods of assaying penicillin, comprising the dilution, cup and turbidimetric methods, and a variety of other less common procedures such as effect of penicillin upon the production by suitable bacteria of hemolysin, nitrite and other metabolic products.

4. Production of penicillin by various other fungi, in addition to above two groups.

5. Studies of the chemical and physical properties of penicillin.

6. Utilization of penicillin for disease control.

7. Mode of action of penicillin upon bacteria *in vitro* and *in vivo*.

In addition to penicillin, other antibiotic agents received considerable at-

tention. It is sufficient to mention streptothricin and streptomycin, substances active upon both Gram-positive and gram-negative bacteria, in contradistinction to gramicidin and penicillin that are largely active against Gram-positive bacteria. The production by bacteria of antibiotic agents, aside from tyrothricin, has also received attention. Various fungi were found to produce more than one antibiotic substance. This is true of *Aspergillus flavus* (aspergillic acid and penicillin), *A. fumigatus* (spinulosin, fumigatin, fumigacin, gliotoxin), and others. Some of the antibiotic agents are produced by a large number of different organisms. Fumigacin, when freed from a small amount of accompanying gliotoxin, was found to be identical with helvolic acid. Clavacin, also designated as claviformin, patulin and clavatin, depending on the organism producing it, is a good illustration; it has now been crystallized and its chemical nature determined. It is active against both Gram-positive and Gram-negative bacteria, and is fairly toxic to animals. Gliotoxin is produced by species of *Trichoderma, Gliocladium,* and *A. fumigatus;* it is a highly potent substance and is active both upon fungi and bacteria.

SELMAN A. WAKSMAN,
Associate Reference

Disinfection of Air by Germicidal Vapors and Mists

The principal advances in this field during the past year are the development of suitable apparatus for the dispersion of glycol vapors and the construction of a device for the automatic regulation of the concentration of glycol vapor in the air. Two types of glycol vaporizers have been made: one operates on the principle of passing heated air over a number of slowly rotating metal discs which dip into a pool of glycol.[1] The amount of glycol vapor dispersed is controlled by varying the temperature of the evaporating current of air. The other type of glycol vaporizer employs the method of boiling water-glycol mixtures and provides a certain amount of water vapor with the glycol vapor.[2] The rate of glycol evaporation is controlled by varying the ratio of water to glycol which determines the boiling point of the mixture. An automatic device for adding water is employed to maintain the boiling point at the desired temperature.

Automatic regulation of the concentration of glycol vapor in the air has been achieved by means of an instrument designated as a glycostat which controls the vapor output of the glycol disperser.[3] The apparatus consists, in brief, of a constant beam of light which is reflected from the shiny rim of a slowly rotating metal wheel, to a photoelectric cell whose current controls the vaporizer. This wheel dips into water and is cooled by evaporation caused by an air current directed against the rim. Glycol vapor condenses on this cooled surface in proportion to its concentration in the air. With increasing deposition of glycol on the wheel rim, the intensity of the light reflected to the photocell is progressively diminished until it ceases to activate the relay interposed between the photocell and the vaporizer, and vaporization of glycol ceases. Conversely as the concentration of glycol in the air falls, condensation on the rim, which is constantly cleaned by passage through water, diminishes, with the result that the intensity of the reflected light increases to the point where the relay closes and the vaporizer is set in operation again. Actual test of this glycostat under practical conditions has shown that it is possible to maintain constantly a bac-

tericidal concentration of triethylene glycol vapor in the air below the saturation point, i.e., without the occurrence of a mist.

Since last year's summary of the subject in this section, there have been several reports on the effectiveness of glycol vapors in controlling respiratory disease and air-borne bacteria. Extension of the study carried on in the wards of a children's hospital [4] revealed a continued marked reduction in the incidence of acute respiratory diseases in the glycol treated wards. Observations on the bacterial population of the air in glycol treated and untreated wards have shown a pronounced diminution of air-borne bacteria in the former spaces.[4, 5] A study of the effect of triethylene glycol vapor on a single respiratory pathogen, namely beta hemolytic streptococcus group A which was present in considerable numbers in the air of wards housing patients suffering from upper respiratory infections due to this agent showed that the glycol produced a reduction of approximately 65 per cent in the number of air-borne streptococci. However, when the vapor was employed in conjunction with oil treatment of bedclothing and floors the reductions exceeded 90 per cent.[6, 7]

REFERENCES

1. Coey, S. C., and Spiselman, J. W. To be published.
2. Jennings, B. H., Bigg, E., and Olson, F. C. W. *Heat. Pip. & Air Cond.*, ASHVE Journal Section, 16:538-545 (Sept.), 1944.
3. Puck, T. T., Wise, H., and Robertson, O. H. *J. Exper. Med.*, 80:377, 1944.
4. Harris, T. N., and Stokes, J. *Am. J. M. Sc.*, 206:631, 1943.
5. Personnel of Navy Medical Research Unit No. 1, *U. S. M. Bull.*, 42:1288, 1944.
6. Hamburger, M., Jr., Puck, T. T., and Robertson, O. H. *J. Infect. Dis*, 76:208, 1945.
7. Puck, T. T., Hamburger, M., Jr., Robertson, O. H., and Hurst, V. *J. Infect. Dis.*, 76:216, 1945.

O. H. ROBERTSON, M.D.
Associate Referee

Disinfection of Air by Ultra-violet Irradiation

In an important investigation, Lurie of the Phipps Institute [1] reported on "The Prevention of Natural Air-borne Contagion of Tuberculosis in Rabbits by Ultraviolet Irradiation." This paper establishes the "air-borne route" for the transmission of tuberculosis in rabbits. Striking results in regard to control of tuberculosis by means of ultra-violet were obtained. The practical application of these findings in the prevention of air-borne transmission of tuberculosis in man will have to overcome certain technical difficulties. Not the least is the fact that man can safely be exposed to only very little radiation of 2,537Å.

In a comparative study of the sensitivity of viruses and bacteria to monochromatic ultra-violet radiation it was reported that influenza virus has a maximum of sensitivity at 2,650Å very similar to bacteria, and that this virus is about twice as resistant as *Escherichia coli* to ultra-violet radiation.[2]

A number of studies on the control of air-borne contagion in day schools are in progress; however, no further publications on the results of these studies have been published.

The difficulty in obtaining reliable epidemiology data on the control of air-borne contagion has been emphasized by a study of the National Institute of Health on the use of ultra-violet upper air irradiation of sleeping quarters in a boys' training school.[3] This study which gave interesting information on other points gave little information on the value of ultra-violet in the control of upper respiratory infection because the incidence of illness during the period of study was very low.

The use of ultra-violet radiation in

the control of air-borne contagion in crowded military sleeping quarters was tested by using upper air as well as floor irradiation in an extensive study at a naval training station.[4] The reduction of upper respiratory infection was about 25 per cent during a season of relatively low incidence of illness. It was brought out in this study that the intensity of ultra-violet radiation is of greatest importance for the control of cross-infection. Such evidence has also been presented by Lurie[1] in his study on tuberculosis.

REFERENCES

1. Lurie, Max B. *J. Exper. Med.*, 79:559-573, 1944.
2. Hollaender, A., and Oliphant, J. W. *J. Bact.* (in press).
3. Schneiter, R., Hollaender, A., Caminita, B. H., Kolb, R. W., Fraser, H. F., DuBuy, H. G., Neal, P. A., and Rosenblum, H. B. *Am. J. Hyg.* (in press).
4. Wheeler, Lt. S. M., Ingraham, Lt. H. S., Hollaender, A., Lill, N. D., Gershon-Cohen, J., and Brown, E. W. *A.J.P.H.*, 35, 5:457 (May), 1945.

ALEXANDER HOLLAENDER, PH.D.
Associate Referee

Fungicidal and Fungistatic Agents

Proposed Method for Testing Fungicides against Trichophyton

The recently increased demand for fungicides to be used in treatment and in combating the spread of dermatophytosis has emphasized the immediate need for a standard method of testing fungicides. The following method is offered to meet this urgent need.

The method is strictly an *in vitro* test and is not intended to provide criteria for judging proficiency in practical use. However, it would seem that concentrations of preparations unable to destroy the organism under conditions of the test would not be suitable as fungicidal agents for general use on inanimate objects and surfaces such as floors contaminated with pathogenic fungi. Products intended for therapeutic use and showing by this test a suitable fungicidal activity must be examined separately for toxicity and irritating properties, ability to penetrate epidermis, and other characteristics important in clinical use.

The method is applicable to water soluble fungicides. Water immiscible materials may be tested, but unless stable dispersions are obtained, reliable checks cannot be expected. It may be desirable to adapt this method to testing fungicides not soluble in water by using some other diluent. Preliminary studies indicate that this may be possible.

The number of conidia in the inoculum (2,500,000 per 5 ml. of fungicide dilution) is not intended as a safety factor to compensate for organic matter or other protective factors to be met in practical application, but was adopted to minimize false negatives resulting from the possibility of picking up loops of material without organisms in the course of conducting the test. It is essential that enough conidia be in the inoculum to permit the making of subtransfers. Otherwise failure to differentiate between fungicidal and fungistatic action may completely invalidate conclusions. The method of detecting fungistatic action by subtransfers is admittedly imperfect. Dilution of the fungicide sufficient to prevent fungistatic action, accomplished by transferring a loopful of the fungicide-conidia mixture into a suitably large volume of broth, becomes impractical in cases where perhaps 1,000 ml. would be required. Therefore the operator must learn by trial within the procedure as outlined, and to some extent for each fungistatic agent tested, a compromise whereby a fair sample of spores is carried to the subtransfer without transferring at the same time enough of the fungistatic agent to inhibit growth in the subtransfer tube.

The use of a phenol control is specified solely for the purpose of providing a standard check upon the resistance of the conidial suspension used in the test. It is generally recognized that it is improper to compare the action of phenol with unrelated fungicidal and bactericidal agents, and it is not intended that in this method the final results be expressed in terms of phenol coefficients.

TEST ORGANISM

The test fungus shall be a typical strain of *Trichophyton mentagrophytes* (*T. interdigitale, T. gypseum*) isolated from dermatophytosis of the foot. The strain shall sporulate freely on artificial media. The presence of abundant conidia is manifested by a powdery appearance on the surface of a 10 day culture, particularly at the top of an agar slant, and can be confirmed by microscopic examination. The conidia-bearing mycelium should peel easily from the surface of dextrose agar. Conidia of the required resistance shall survive a 10 minute exposure at 20° C. to a phenol dilution of 1:60, but not to one of 1:45.*

CULTURE MEDIA

The fungus shall be carried on agar slants of the following composition: C.P. dextrose 2 per cent, Neopeptone 1 per cent, agar 2 per cent, adjusted to pH 5.6–5.8. The same culture medium shall be used in preparing cultures for obtaining a conidial suspension, and a fluid medium of the same nutrient composition (without agar) shall be used to test the viability of conidia after exposure to the fungicide.

CARE OF THE FUNGUS STRAIN

A stock culture of the fungus on dextrose agar slants shall be stored at 2–5° C. At intervals not to exceed 3 months it shall be transferred to fresh agar slants which shall be incubated at a temperature between 25° and 30° C. for 10 days and then placed in storage at 2°–5° C. until the next transfer period. No culture which has been kept at room temperature or higher for more than 10 days should be used as a source of inoculum for culture purposes. Cultures may be kept at room temperature for preservation of the strain and for the inoculation of cultures if transferred at intervals not exceeding 10 days.

PREPARATION OF THE CONIDIAL SUSPENSION

Petri dish * agar cultures shall be prepared by planting the inoculum at the center of the agar plate and incubating the cultures at a temperature between 25° and 30° C. for 10 days and not exceeding 14 days. The mycelial mat shall then be removed from the agar surface to a flask containing 20–25 ml. physiological salt solution (0.85 per cent NaCl) per plate by means of a sterile spatula or heavy flattened wire. The conidia are freed from the mycelium by shaking the mixture gently with or without glass beads, and the suspension is filtered so that hyphal elements are removed while conidia pass through. Sterile absorbent cotton in a sterile funnel is suitable. This should yield 10–25 million conidia per ml. The density of the conidial suspension is estimated by counting in a hemocytometer and diluted with physiological salt solution so that it contains 5 million conidia per ml.

OPERATING TECHNIQUE

Dilutions of the fungicide are prepared. Methods of making dilutions

* A suitable strain (No. 9533) has been deposited with the American Type Culture Collection.

* Bottles 11 cm. high, 4.5 x 6 cm. in cross-section, and with neck 3.5 cm. in diameter can be substituted for Petri dishes.

as outlined in U.S.D.A. *Circular 198* for determination of phenol coefficients are suggested and the test procedures are similar to the procedures outlined therein. Five ml. portions of each fungicide solution and the phenol control solutions are placed in 25 x 150 mm. culture tubes and arranged in order of ascending dilutions. These are placed in a 20° C. water bath until the temperature of the water bath is reached. With a graduated pipette 0.5 ml. of the spore suspension is placed in the first tube of the fungicidal solution, the tube shaken, and immediately replaced in the water bath. Thirty seconds later 0.5 ml. of the conidial suspension is added to the second tube. This procedure is repeated at 30 second intervals for each of the fungicidal dilutions. If more convenient the test may be run at other time intervals. After 5, 10, and 15 minute periods of exposure to the fungicide, a sample is removed from each conidia-fungicide mixture with a 4 mm. loop and placed in 10 ml. of the dextrose broth mentioned above. To eliminate the risk of faulty results due to the possibility of fungistatic action, subtransfers must be made. This may be done by withdrawing a loopful of the conidia-fungicide mixture, touching it to the surface in a tube of dextrose broth as described above, and immediately immersing it in a second tube of broth. The inoculated tubes are incubated at 25°–30° C. Final results are read after 10 days, although an indicative reading can be made in 4 days.

C. W. EMMONS, PH.D.,
Associate Referee

Prepare for Winter Now!

The Solid Fuels Administration for War asks the JOURNAL to request public health workers, particularly health officers and health educators, to inform the public of the tight fuel situation which the population will face this winter.

All fuel will be scarce next winter, the Solid Fuels Administration declares. The need for conservation is urgent and people should be asked to prepare for winter now by doing the following things:

1. "Store now whatever kind and quantity of fuel your dealer can let you have. If you burn coal or coke, don't wait for some preferred kind that may never be available, or insist on getting more than your fair share. Take your dealer's advice on your coal problems.

2. "Check up on all heating equipment, whether fired by oil, coal, or gas, to insure peak efficiency. Clean your furnace and install controls or other heat-saving devices where available. Learn how to get the full amount of heat from the fuel you use.

3. "Protect your home against loss of heat by installing insulation, storm windows, and weather-stripping. The work can be financed with convenient monthly payments suited to your income on the FHA plan. 'Heat-sealing' pays big dividends by cutting your fuel bills."

Detailed information on saving fuel by heat-sealing houses may be obtained from the Solid Fuels Administration for War, Washington 25, D. C.

Milk and Milk Products*

Laboratory Section

THANKS to the constructive discussions that took place on May 5 and 6, 1944, at a joint meeting of this committee with the Committee on Frozen Desserts, various revisions of laboratory procedures are being prepared for presentation to the Section and the Association probably next year.

A section now in process of revision is the one dealing with the sediment testing of milk, cream, butter and cheese. Effective use has been and is being made in many areas of "off the bottom" sediment testing of milk and of qualitative examinations of sediment in butter and cheese. The methods in current use are being incorporated in the text of the proposed new edition of the Dairy Products Report by a subcommittee on sediment testing, Dr. E. H. Parfitt of Chicago, *Chairman.*

Likewise a subcommittee composed of men from laboratories that make extensive use of the methylene blue reduction test has been working on a revision of the text describing this technic. C. A. Abele of Chicago is Chairman of this subcommittee.

A new section describing the resazurin technic as now used in many milk control laboratories has been prepared by Dr. C. K. Johns of Ottawa, and a new section describing methods for isolating common pathogens from cheese has been prepared by Dr. M. W. Yale of Green Bay, Wis. The need for the latter section has been emphasized by the recognition during the current year of a number of serious epidemics of typhoid fever traced to the eating of uncured cheddar and other types of cheese.

The standardization of the phosphatase test as applied to dairy products is being studied by Dr. J. H. Shrader of Wollaston, Mass.

ROBERT S. BREED, PH.D., *Chairman,* New York State Agricultural Experiment Station, Geneva, N. Y.

* Report of the Standard Methods Committee on Milk and Milk Products.
STANDARD METHODS COMMITTEE ON EXAMINATION OF DAIRY PRODUCTS
Organized 1905. Reorganized 1933. Published reports: *Year Books,* 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1938–1939, 1939–1940, 1940–1941, 1941–1942, *A.J.P.H.,* May, 1943, Aug., 1944.
8 volumes published: 1910, 1916, 1921, 1923, 1929, 1934, 1939, 1941.

Standard Methods for Dairy Products*

THE present (8th) edition of *Standard Methods for the Examination of Dairy Products* is the work of a group of specialists who have acted as referees and associate referees. Because of this fact, the text has lacked unity. Largely because of constructive criticism from teachers and administrators, a subcommittee composed of Dr. A. H. Robertson and Dr. S. R. Damon have been busily at work

* Report of the Joint Editorial Committee for Standard Methods for the Examination of Milk and Milk Products.
† Published in Feb., 1945—price in the United States, 10 cents.

during the past year preparing a more unified text for the next edition of this widely used report.

Thanks to the help given by the main office of the Association in preparing and distributing 80 mimeographed copies of the proposed new text and in arranging for a joint meeting of the Committee on Milk and Milk Products and the Committee on Frozen Desserts in New York City, May 5 and 6, 1944, the preliminary manuscript is being further developed. Some new sections are being incorporated and directions are being amplified and arranged in a form that will make the report more useful than it is at present.

Unavoidable delays have occurred in publishing the Spanish translation, a summary of the text of the present edition prepared by Dr. de la Garza Brito with the assistance of other Spanish speaking members of the Association. It is hoped that all obstacles have now been overcome, and that the printing and distribution of this Spanish edition will take place within the next six months.†

The eighth edition of the Dairy Products Report has been reprinted during the year with certain corrections in the text. These corrections were published in the March, 1944, number of the *American Journal of Public Health*, p. 303. Separate copies of the corrections are available and will be sent to anyone applying to the Association office for them.

R. S. BREED, PH.D., *Chairman*,
New York State Agricultural Experiment Station, Geneva, N. Y.
E. M. BAILEY, PH.D.
A. PARKER HITCHENS, M.D.
F. LEE MICKLE, SC.D.
HENRY T. SCOTT, PH.D.

North Dakota Public Health Association

The Second Annual Meeting of the North Dakota Public Health Association was held in Grand Forks, May 25 and 26. The featured speaker on the program from outside the state was Dr. Haven Emerson of New York City who spoke on Full-time Health Units, based on the work of Dr. Emerson's committee of the A.P.H.A.

The North Dakota Public Health Association went on record as supporting the establishment of the proposed health center at Grand Forks, including a 4 year medical school. The association also went on record as endorsing the establishment of full-time health units in North Dakota in accordance with the American Public Health Association standards, in so far as they can be applied to North Dakota. The association decided to put forth increasing effort to affiliate with the American Public Health Association.

Officers for 1945 and Advisory Council members included the following:

President: Francis C. Lawler, Sc.D., University of North Dakota, Grand Forks
Vice-President: Irene Donovan, State Health Department, Bismarck
Secretary: Bernardine Cervinski, State Health Department, Bismarck
Treasurer: R. O. Baird, State Laboratories Department, Bismarck
Advisory Council: K. C. Lauster, State Health Department, Bismarck; R. G. White, Burke-Ward-McLean Health Unit, Minot; Mrs. Jerome Evanson, Farmer's Union, Jamestown; Everett Lobb, City Health Department, Fargo; Amanda E. Hendrickson, State Teachers' College, Dickinson; Carlyle Onsrud, Welfare Board, Bismarck.

Report of the Archivist, 1944

Laboratory Section

IN assuming responsibility for the archives of the Laboratory Section from Dr. Wadsworth, I fear that I have undertaken an obligation that will be difficult to fulfil, despite the advantage of the experience of the past nine years, during which I have become familiar with the materials that have been deposited. The plan has been first to garner records and recollections of the early years of the Section, and to defer a complete analysis of them to the time when all that could reasonably be hoped for had been received. Previous reports record the considerable collection deposited by early officers of the Section.

Since 1941 there have been placed in the archives, by action of the Council, the minutes of the meetings of the Section and of the Council; and an account of the work and the final report of the Committee of the Laboratory Section on Educational Qualifications of Laboratory Personnel, William D. Stovall, M.D., *Chairman*. This report is the only document (outside the minutes) regarding a current activity that has been deposited in response to the Council's endeavor to preserve records of, or related to, the transactions of the Section. It is a valuable contribution and I hope it is indicative of future deposits by other committees or individuals. The test of the archival quality of a record is still often taken to be that of age. But any document that forms a part of an official transaction and that should be preserved for official reference should be deposited in the archives as soon as it ceases to be of current use; and not only the specific document but associated and related papers and references.

The office of archivist was established in 1935, and the annual reports to the Section on the status and needs of the collection have been published regularly since then. It would thus seem that all extant early records and correspondence have been deposited and that the time had come when the secondary duties of the archivist might be undertaken; namely, a simple accession or inventory of deposits and, subsequently, a detailed examination of the several items to make them more fully available as historical records or for reference. I hope to make a beginning on this project in the coming year.

ANNA M. SEXTON

Anthrax in the United States, 1939-1943*

Industrial Hygiene Section

FIVE years ago we presented a twenty year survey of anthrax in this country, showing statistics divided into four 5 year periods.[1] The present report gives the results of a survey of the past 5 year period, 1939–1943. In 1941 we presented a picture of anthrax in Philadelphia only,[2] showing an increase in anthrax incidence with a change in trend toward a decrease in tannery anthrax and an increase in anthrax due to imported wool and hair. In 1942 we again presented figures for Philadelphia only,[3] showing at least a threefold increase in this wool-and-hair anthrax. The present survey shows that this increase in wool-and-hair anthrax has actually been almost fivefold in the past 5 year period.

In collecting the detailed information for this report we have had much more coöperation from state and local health officers, hospitals, physicians, and industrial plants than ever before. Very few have failed to reply to inquiries, though in some instances much is still to be desired in methods of record keeping and reporting. Mississippi, which in past periods has reported prodigious numbers of cases but could not distinguish between human and animal cases, no longer requires any reporting of anthrax cases "in order to relieve physicians of the burden in reporting more important diseases." Wisconsin is another state which requires no reporting of such cases, but which, nevertheless, had more or less information on several cases.

New York State Department of Health has kept very excellent records of all cases of anthrax until 1934, but since that time has discontinued all follow-up of cases reported in order to avoid duplication of the same work done by the State Department of Labor; they will, however, resume such follow-up in the future. The Department of Labor knew of only three of the ten bacteriologically-proven 1943 cases, seven of which were very definitely industrial cases, yet this department stated that the reporting of anthrax was more accurate than the reporting of other occupational diseases! This same lack of knowledge of cases in a few other state departments of labor also exists, their chief interest apparently being only in those cases requesting compensation. Some states still continue to report or obtain reports by the numerical card-checking system, so that on follow-up we still find cases of botulism, etc., listed as anthrax.

Nebraska claims no human cases, but with such a very great incidence in animals as is found in this state, it is difficult to believe that no human infections have occurred. Even though their State Department of Agriculture may be doing excellent educational work, one wonders if the human case reporting is as complete as it should be,

---

* Report of the Committee on Industrial Anthrax.

COMMITTEE ON INDUSTRIAL ANTHRAX

Organized 1924. Published reports. *A.J.P.H.* Nov., 1924, Jan., 1926, Feb., 1930, *Year Books* 1934–1935, 1939–1940, 1941–1942, *A.J.P.H.* July, 1943. The two most informative reports, while not published, were mimeographed for distribution by the U. S. Public Health Service– reports of Oct., 1938, and Oct., 1939.[1]

especially since the State Department of Agriculture has made mention of "several human cases."

In a number of states we find reported cases in which diagnoses have been reversed by physicians but which have remained on the records as anthrax. The one state, however, which could give us the least help five years ago, gave us such complete reports this time that no follow-up was necessary. If all states had reported as did Texas, we should have had a most complete survey indeed! And surely the work of obtaining complete records routinely for this disease should not be too burdensome for each state department of health if one man alone, in addition to his regular work, can obtain this information for the whole country! We have found, however, that only through repeated follow-up letters to physicians, hospitals, local health boards, employers, and sometimes even patients, can we obtain an anywhere near accurate picture from the accumulated information sent us by the various state departments of health.

The accompanying table may at first appear complicated, but in order to give a more comprehensive picture of the whole anthrax situation throughout the country, it may prove more enlightening than several less comprehensive tables. This table shows the anthrax incidence and mortality in this country for the past 5 year period by states, by years, and by source of infection, and compares this incidence with that of the previous 5 year period.

In the past 5 year period the source of infection was stated in all but 11 cases, none of these being in states reporting either tannery or woolen-mill anthrax. In the previous 5 year period the source of infection was stated in only 256 of 357 cases, but in the industrial states practically no cases were recorded without source of infection, so that we feel that the reporting of tannery anthrax and textile-mill anthrax gives an accurate picture. Probably the reporting of unusual non-occupational cases is likewise fairly accurate, or at least such a small factor as to influence the total very little, so that we may assume that the greater part of the cases not reported as to source, are due to contact with animals or local animal products, or else have possibly been reported in error, since confirmation has often been impossible.

Among the non-occupational cases we have recorded a few acquired at place of occupation, but not generally considered industrial or agricultural. We have previously recorded several shaving brush cases, but not one of these was recorded in this period, although one death was attributed to a toothbrush, and one case to a hairbrush. Two were attributed to furred coats, one to a wool-lined cap, and one to fur discarded by a taxidermist. One fatality was due to cleaning test-tubes which had contained the organisms in a university laboratory. Three cases were attributed to fertilizer or soil, or at least were acquired while gardening, although one of these was in a mail-carrier in a mill town where there were many cases of anthrax. One fatal pulmonary case occurred in a Navy Yard worker, possibly due to wastes used to wipe machinery. The sources of the remaining five cases were impossible to detect—one fatal pulmonary and blood-stream infection in a 10 year old child in a mining location in a state where animal anthrax had been unknown for ten or more years; one roofer, one hardware merchant, a fireman in a smelting plant, and a student.

Among the agricultural cases we also find a decrease over the previous period, but we feel that these figures are the least accurate of all. There are doubtless many undiagnosed and unreported cases, while, on the other hand, a few cases in animals are occasionally

INCIDENCE OF ANTHRAX IN THE UNITED STATES

A = Animal Anthrax
H = Human Anthrax
0 = Never Reported
− = Reported in previous years only
+ = " " past five years =
++ = " " " " " and previously
Exponent Figures = Fatalities

STATE	A	H	NOTES AND EXPLANATIONS	TOTAL CASES BY PERIODS (P1 = Period '36-'38; P2 = Period '39-'43)		SOURCE OF INFECTION													
						HIDES & SKINS		WOOL & HAIR		AGRICULTURAL		NON-OCCUPATIONAL		NOT STATED	
				P1	P2	'39	'40	'41	'42	'43	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
U.S.A.				357[51]	408[33]	53[9]	91[5]	94[7]	99[9]	81[9]	97[7]	79[9]	51[8]	23[7]	94[19]	65[10]	14[4]	16[4]	101[17]	11[0]
ALA.	++	+		0	2					2						2			Child, 10 yrs, from mining settlement	
ARIZ.	0	++	Case reported from Tempe in '41 was clerical error	2	1		1								2			1		
ARK.	++	++	USPHS Reports show 1 case for '40, reported in error.	4	4'		1'		2	1					4	3'	Child, 3 yrs, Pneumonic		1	
CAL.	++	++	USPHS Reports show 4 cases for '43 which were in reality botulism cases.	17[2]	11'	5	4	1	1'	0		?	?		17[2]	11'	Includes 2 cases in Tanneries using local hides			
COL.	++	++		5'	1		1	Includes butcher, circus animal manager, and 2 users of local wool							5'	1				
CONN.	−	−		2	0									1	1					
DEL.	++?	++		18[3]	14	5	1	3	3	2	17[3]	14			1		Manure on mushroom field			
D.C.	0?	+	USPHS Reports show 3 cases for '39, reported in error.	0	1			1					?		New hair brush	1				
FLA.	−	−	Diagnosis was reversed in '41 case reported to USPHS.	2'	0								?		2'		N.K. hand; wool			
GA.	++	++		2'	5		1		4						2'		Cattle from MS.			5
IDAHO	0	+?	See Montana.	0	0												Cordage plant, Mexico Cap. Sisal Fibre			
ILL.	++	++		4[2]	1					1			2'	1	1			1'	Fur collar?	
IND.	−	−		2[2]	0		Possibly local hides				1'				1'		Chewing pasture grass; internal			
IOWA	++	++		4[1]	4		1	2		1					4'	2				2
KAS.	−	−	1 case reported in '43 was contracted in Missouri and treated in Kansas	2[2]	0										2[2]			Internal		
KY.	?	−		0	0															
LA.	++	++	1 case for '42 reported by U.S.P.H.S. was in animal; 2 in '43 had diagnosis reversed.	18[4]	11'		2'	3	5	1					1' making stuffed of horse bones			Shading brush?		
ME.	−	++	1 case in '41, tannery, later had diagnosis reversed; not included here.	0	2'				2'							16[3]	11'	1	1'	
MD.	++	−		0	0										Meat Cutter	2[2]	1'	Dealer, local cattle + wool		
MASS.	++	++	1 case for '39 in USPHS Reports was in our '38 report; State has no knowledge of 4th '39 case.	29[2]	27[3]	2	9	6'	5[2]	5	1 Intestinal 27[2]	22[2]			Include 3 freight handlers; machinist 4'		2[0]	1 man, 1 veg.	1	Fur coat?
MICH.	0	−	Diagnosis was reversed in one '39 case reported by USPHS	3	0			Includes 3 truckers					Butterman				1	Truck driver	2	

| | | |

reported as human cases. In one instance the state health department had reported a case in enough detail to give name and address of patient and source of infection, but follow-up proved that "this case was two calves on the farm of the presumed patient." Missouri appears to be the only state in which animal anthrax has been reported for the first time, though from reports of human cases in previous periods we suspect that unreported animal anthrax may have existed earlier. Undoubtedly the apparent decrease in human cases due to animal contact has been due to the active campaigns of departments of agriculture for animal vaccination. On the other hand, many isolated outbreaks of animal anthrax in the past few years have quite probably been due to the importation of bone meal, which state officials and users have felt to be safe because they have met the regulations of the U. S. Bureau of Animal Industry. These regulations, however, were designed to control other diseases, and are entirely inadequate to eliminate anthrax spores. Thus anthrax may have been introduced into many new localities through the oversight of our Bureau of Animal Industry.

We have collected a mass of information from all of the states concerning the control of anthrax in animals, and the degree to which the departments of agriculture coöperate in trying to prevent human anthrax, but since this is not of primary interest to an industrial group such as this, and since it would be impossible to handle it adequately here, it is felt that another paper on this phase, published in an agricultural or livestock journal early in the spring, would accomplish much more than a detailed discussion here. There are, however, one or two points which we should perhaps mention briefly here concerning the frequent lack of cooperation between our agricultural and health agencies. In one state which always has a great deal of agricultural anthrax, the livestock sanitary board, in its zeal to obtain positive confirmation of anthrax in animals, has published instructions to stockowners suggesting that when an animal dies a few drops of blood be smeared on glass and mailed to the laboratory. There is no warning included which would protect the stockowner from becoming infected during this process, and slides so prepared, if the package should become unwrapped in transit, could possibly disseminate infection. This same publication also advocates deep burial of carcasses but does not mention the use of lime, although several cases have resulted from unearthed carcasses.

Another concern of the health agencies should be the availability of adequate treatment in areas where agricultural anthrax is likely to occur. I mention later the question of whether or not serum is necessary, but in the past when it has been so considered, it has often been unavailable until too late to be effective.

A third need requiring coöperation between these two agencies relates to the proper disposal of infected animal products. In several instances infected meat (usually horse) has produced anthrax in circus animals, zoos, and minkeries; and butchers and animal handlers have become infected. Several cases such as those mentioned in California, show that such infected local products as cattle hides and dead wool do reach industrial tanneries and textile plants in spite of Bureau of Animal Industry regulations to the contrary. In one instance mink skins from infected animals were allowed to be sold to unrecorded markets after being submitted to a bichloride of mercury treatment recommended by the U. S. Bureau of Animal Industry, but proved by us to be ineffective against anthrax. Although no cases proved to have resulted

from these furs have been noted, it is possible that some of our cases in which no source could be found may have been due to these. There is a very real need for much closer coöperation between federal, state, and local health and agricultural agencies than at present exists.

Anthrax due to imported hides and skins is almost entirely tannery anthrax, although we have included here a few cases in those handling these materials in transit, and outside machinists and workmen called in to make plant repairs. With the exception of an occasional tannery in states dealing with local products, these are located chiefly in five states—Delaware, Massachusetts, New Jersey, New York, and Pennsylvania. The decrease we note in tannery anthrax, while doutbless accurate, lends a very false sense of security because in the present war emergency very few goatskins, which are probably the cause of more than 90 per cent of the tannery anthrax, are being processed, and most of the stock handled consists of the more durable cattle hides obtained largely from healthy animals killed for food. Under certain conditions of moisture followed by heat, as exist in many countries exporting goatskins, anthrax organisms may multiply rapidly. As in the last war, baled skins, for lack of transportation, may remain stacked on docks and in leaky warehouses until whole bales have become permeated with organisms originating perhaps from only one infected skin in the bale. There is, therefore, sure to be a sharp rise in the incidence of tannery anthrax as soon as there is again a demand for fancy shoes and these accumulated skins are imported and processed by the tanneries.

Tanneries are also lulled to a false sense of security by the glaringly inadequate regulations of our U. S. Bureau of Animal Industry concerning importations of hides and skins. We have pointed out so many times the complete worthlessness of consular certificates to the effect that no anthrax exists where skins originate, that it seems hardly necessary to repeat it again, and all other regulations are designed against other infections, being wholly inadequate as to anthrax. Previous regulations did at least attempt to prevent soil infection from tannery wastes by the lime-soak and bichloride methods and disinfection of effluents, but since these were found ineffective, they were discarded. The very fact that these regulations were withdrawn, however, led tanners to feel that anthrax was no longer a hazard.

If we wish to be forward-looking and prevent the increase in tannery anthrax which is certain to follow the close of the war with return to normal production and consumption, we must immediately undertake research which will produce an adequate method of sterilizing hides and skins before they are handled or processed, and our tanners should be made aware of this need.

In spite of the inclusion in our previous 5 year figures of an unusual number of cases from Mississippi, Texas, and West Virginia which could not be confirmed and may well be questioned as true cases, we still show a 16 per cent increase in total number of human cases of anthrax in this country. Actually this increase may have been greater still, even though both agricultural and tannery anthrax showed decreases. This is due to a 365 per cent or nearly fivefold increase in anthrax due to imported wool and hair. Nearly all of this is in textile mills and a few brush-making establishments, although as in the case of tannery anthrax, we have included a few handlers in transit, outside machinists, etc. We have also included here a unique group of cases in New Jersey resulting from the use as fertilizer of wool wastes col-

lected at woolen mills. Since most of these cases occurred in plants where both wool and hair from numerous foreign countries, all known to have much animal anthrax, were being processed at the same time, no separation of the two as sources of infection could be made with any degree of accuracy; hence they are grouped together. With only two exceptions these cases were also concentrated in five states—Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania.

After all that we have said and continually repeated during the past twenty years concerning the certainty of such an increase and the reasons therefor, we hardly need state that all of this could have been prevented if we had established such a government disinfecting station as England has so successfully operated since 1921.

The remarks I have made as to Bureau of Animal Industry regulations concerning hides and skins are equally true of wool. The regulations are practically identical for both materials, and entirely inefficient in protecting against anthrax. Yet I know from letters received that many state, local, and plant officials feel that because these regulations have been complied with, they have been protected by the government.

We have been trying for years to interest the U. S. Public Health Service in the disinfection of wool and hair at port of entry, but they have never felt this disease to be important enough to warrant their attention. It is true that the Industrial Hygiene Division of the Public Health Service, through the interest of Section members who were in authority in this Division, mimeographed for free distribution two of our Committee reports, for which we were most grateful, but that seems to be the extent of the interest taken. Because the Public Health Service had ceased to obtain detailed information on cases, and were merely receiving numerical reports of cases as city or state health officers saw fit to send them in, we mistakenly stated in 1942 that the Public Health Service no longer required the reporting of anthrax to them. Dr. E. R. Coffey, then Assistant Surgeon General in charge of the since discontinued Division of Sanitary Reports and Statistics, requested a correction of this statement, which was made, but we still feel that to date our Public Health Service has not been interested in this problem. Dr. Coffey stated that the numerical reports received by him were published in the U. S. *Public Health Reports,* but that no attempt was made to confirm these except " in the case of an unusual outbreak," when an attempt is made to secure more detailed information as to location and source of infection. In considering the inadequacy of Bureau of Animal Industry regulations, Dr. Coffey suggested that it might be possible that an amendment to the Foreign Quarantine Regulations could be prepared to cover importation of wool, hides, etc., in a manner similar to that covering importation of hair and bristles for shaving brushes, but that it might be considered more advisable for the prevention of anthrax to be handled by appropriate industrial hygiene measures in the industries involved. In our 1942 report we suggested that the English method of disinfection might be adaptable to individual mills in combination with their wool-scouring process, but after personal visits to such mills we find that this would be entirely out of the question since the cost of expansion to include such a disinfecting set-up would be prohibitive for the individual mill, especially if that mill had to compete with another who refused to follow suit.

Certainly if our Public Health Service intended to take action on " cases of unusual outbreaks," it should have taken such action when wool-and-hair

anthrax showed a fivefold increase, but because of a decrease in tannery and agricultural anthrax, and because they have no interest in collecting information as to source, they were apparently blissfully ignorant of this condition. It is also certain that if they have no intention of handling the problem at port of entry where protection would be afforded all handlers all the way along, but expected the disease to be prevented "through appropriate industrial hygiene measures in the industries involved," they should definitely be prepared to give such industries an adequate answer upon requests from them as to how they can so protect themselves.

I know of at least one mill who, upon appealing to the Public Health Service for instruction as to how they might avoid further infections, was merely referred to this Committee—an entirely voluntary agency, unfinanced, and with no facilities for research. It should be the duty of the U. S. Public Health Service either to establish a port-of-entry disinfecting station, or to undertake research which could give our industrial officials an answer as to how they can protect themselves. Yet, in reply to a letter this spring to Surgeon General Parran expressing concern over the huge government stockpile of foreign wool which is being released for sale and used in government clothing, etc., and which is a tremendous potential anthrax hazard, J. K. Hoskins, Chief of the Sanitary Engineering Division wrote that "at a discussion of the proper committee at the Annual Conference of State and Territorial Health Officers it was decided that steps toward establishment of wool disinfection stations should not be undertaken at this time. We are, therefore, not in a position to pursue this matter further at present." It is natural that such an organization would have little interest since all but two of our wool-and-hair anthrax cases have occurred in only five states.

We are now getting bacteriological confirmation of practically all of our industrial cases. These are for the most part handled by physicians and hospitals who see so many cases that this work has become routine. It is another matter, however, for those who see only a case or two in their whole experience, and for them particularly, we wish to say that consideration of known exposure, clinical picture, and bacteriological results should all be weighed in making a diagnosis. It is quite possible for a technician unfamiliar with the procedure to obtain negative cultures or smears from a positive case; but it is equally possible that such examination may reveal an anthrax infection where it is least expected. Wherever the slightest doubt exists, however, treatment should be started immediately, without waiting for bacteriological confirmation or further development of a typical lesion.

When this committee was first formed about twenty-five years ago, the accepted method of treatment consisted of excision and phenol injections. Later, anti-anthrax serum came into use, both locally and intravenously. With its advent the fatality rate decreased sharply, but serum-sickness and sharp reactions have so frequently occurred that physicians are now turning more and more to chemotherapy—arsenicals or sulfa-drugs—with a definite policy of "hands off the local lesion," and they seem to have produced as good or better results than they did with the serum. A few have just begun to try penicillin, but not enough from which to draw any opinion as to its efficacy. From several physicians who have each treated numerous cases in this past 5 year period with apparently equally good results, we have received quite emphatic recommendations for their own method and denouncement of the other

methods. One treats entirely by local injections of serum and has kept many on the job throughout, with no time loss. Another prefers neoarsphenamine, with serum only in the most serious cases. A third prefers sulfathiazole by mouth, while still others feel that only serum should be used. There are still too few cases treated by each method to draw statistical conclusions, but certain it is that the fatality rate of anthrax from all sources (influenced largely this time by the great number of textile-mill cases) has dropped to only 8 per cent—practically one-half that of the previous 5 year period. We cannot attribute this to less virulent infections, since we still find fatalities high among those handlers of foreign animal products in whom diagnosis and treatment were not prompt. From the data at hand it would appear, therefore, that the chief factors are promptness and rigorousness of treatment. If the sulfathiazole treatment continues to give as good results as it seems to have given so far, it would be the most easily available and administered treatment yet considered.

Until we can produce satisfactory sterilization of foreign hides, skins, wool and hair, we shall continue to have industrial anthrax in our tanneries and textile mills, and the only means of control until that time, must depend not only upon protective clothing, personal hygiene, and "good housekeeping," such as we have frequently discussed in earlier reports, but especially upon eternal vigilance by foremen and plant officials, and constant education of employees, to detect and immediately report the very smallest of lesions. If there is the slightest suspicion of anthrax it might well be advisable to administer an initial dose of sulfathiazole even before diagnosis is made.

Even though we have reports of a few cases which have lost no time or only a few days, by far the greater number of cases are hospitalized at least two or three weeks, and lose from one month up to five months from work. Indemnity and medical costs paid for such cases average well over $300 each, and some of them go into the thousands, to say nothing of the thousands of dollars paid in fatal cases. Neither do these figures take into consideration the loss in production due to these cases. It may readily be seen, therefore, that these cases represent no small economic loss.

We would suggest that, in view of present conditions as here set forth, the Industrial Hygiene Section consider the advisability of requesting the U. S. Public Health Service to reconsider its actions and take steps to plan for the sterilization of imported wool and hair at entry ports, and to make further efforts to develop a satisfactory method of so treating imported hides and skins.

REFERENCES

1. A Twenty Year Survey of Anthrax in the United States, 1939. Mimeo. U. S. Public Health Service.
2. Anthrax in Philadelphia. *A.P.H.A. Year Book 1941–1942*, p. 114.
3. Check Anthrax—A Warning and a Plea. *A.J.P.H.*, 33, 7:854 (July), 1943.

HENRY FIELD SMYTH, M.D., DR. P.H., *Chairman*, Box 232, Pocasset, Mass.
WALTER D. HIGGINS, M.D.

Utilization of Commercial Advertising for Health Education*

Public Health Education Section

THE vast resources of the commercial world which might be available for public health education are largely ignored by public and voluntary agencies whose primary concern is the health of the American people. On the other hand, business recognizes the value to itself of incorporating health education material in its advertising and promotional literature—some of it good and some of it bad. For instance, full-page advertisements in national magazines appear regularly under the sponsorship of various life insurance companies, food interests, drug manufacturers, and other advertisers, containing messages on health subjects, usually without assistance from professional health workers.

As a result of the discussion of this situation at the 1943 Annual Meeting † this committee was created to explore the possibility of developing a program which could utilize these resources of commercial advertising for health education. Your committee has discussed this problem and, although it is not yet ready to recommend a complete and detailed program, we are agreed that the Association should: (1) encourage advertisers to incorporate authentic health messages in their advertising material; (2) develop and promulgate criteria for evaluating the claims of advertisers in public health matters; and (3) consider the possibility of developing a service for commercial advertisers that will advise them concerning the most urgently needed health messages and aid them in expressing these messages accurately.

In view of the necessity for exploring this problem further, the committee recommends its continuance.

DAVID RESNICK, *Chairman*, 1790 Broadway, New York, N. Y.
MURIEL F. BLISS, PH.D.
EDWARD F. BROWN
HOMER N. CALVER
KENNETH W. GRIMLEY, C.E.
ANN W. HAYNES
S. S. LIFSON
RAYMOND S. PATTERSON, PH.D.
PHILIP S. PLATT, PH.D.

* Committee organized 1943.

† Calver, Homer N. Resources of Industry for Health Education. *A.J.P.H.*, 34, 5:489 (May), 1944.

Institute in Health Education

Announcement has recently been received of an Institute in Health Education planned for representatives of Negro colleges. The institute will be conducted jointly by the Office of Education and the Public Health Service, and will be held at Carver Hall, Howard University, August 13–25. In addition to outstanding presentations on health problems, the various representatives of the Negro colleges will discuss how they can utilize the material that they have gathered in their own colleges when they return.

Credit Lines

A DENTAL CARE PROGRAM

As a Dentist and a Dental Tradesman See It

An interesting illustration of social awareness by a commercial organization is represented by two recent numbers of Ticonium, a publication of a firm making prosthetic dentistry materials. One is "A basic Plan for the Protection of the Public and the Dentists in Social Programs," by Donald C. MacQueen, D.D.S., of Los Angeles. Here the author recognizes and welcomes the inevitability of group health insurance as an expression of the acceptance of health as a community responsibility, just as responsibility for education has already long been accepted. Citing in forthright and vigorous language, chapter and verse of the "vested interests" opposition by the American Medical Association to tax-maintained health programs, Dr. MacQueen says "These instances of poor public relations should prove to the dental profession the inadvisability of tying dentistry's star to the political movements of organized physicians." He then suggests the development of a pilot plan to justify a plan of adequate acceptable dentistry in a public health program, the man power requirements, the training of auxiliary personnel, and graduate training of dentists.

The second noteworthy publication is in Ticonium's *Notes and Quotes*, an article on "The Business Side of Dentistry in Health Insurance." by J. J. Nevin, who is the promotional manager of the dental prosthetic firm. He speaks as a dental tradesman who is expressing his concern for the future of dentistry. He deplores that recent polls on the Wagner-Murray-Dingell Bill conducted by two dental magazines show "that the public can expect little assistance from dentistry in its plans to extend health benefits through programs that are economically convenient." He reminds the profession that *Fortune Magazine* and Gallup polls indicate that 75 per cent or more of our people are willing to pay for medical and dental care in the form of taxes; that numerous bills for medical care insurance have been introduced into many state legislatures, and that "no piece of legislation continues to arise in our national and state bodies that does not have the support of public opinion."

Apropos of the Wagner Bill he says further: "What the dental profession thinks of the Wagner Bill or other programs of compulsory health insurance is less important than what the public thinks of dentistry. Dentists, with public approval, operate as a legalized monopoly. As long as the public approves the arrangement, dentists can determine who enters the business of dentistry, set up their own qualifications, discipline their members, and establish dissimilar and non-comparative prices for their services, and hold the quality of their services subject not to consumers' opinions but to their own. Dentists enjoy these unusual privileges because the public believes that dentistry is one of the custodians of its most valued possessions—health. If the public is ever taught to believe that the privileges of this monopoly are being abused for personal gain, dentists may find themselves as completely regulated as the public utilities."

From the standpoint of the business side of dentistry the author points out various areas in which organized den-

tistry has been shortsighted. Among them are the opposition of many dentists to hygienists, as indicated by a heated controversy on this subject in recent issues of the *Texas Dental Journal*. Mr. Nevin says "With dentists busier than they have ever been, here are men who are still fearful that the time may come again when cleaning of teeth will be welcome and who are worried about hygienists taking business from one office to another."

Another illustration of shortsighted policy is the profession's recommendations for industrial dentists. Without any apparent recognition of the right of labor and management to some say as to the scope of the industrial dentist's work, the profession has already laid down the principle that the industrial dentist must confine himself to dental health education, examination and emergency work.

A third illustration is the action of dental societies in several cities with respect to the dental health programs of schools, whereby schools have been compelled to limit their work to education and examinations and refer all treatment activities to the private dentists, who have then failed to care for children adequately.

In discussing the relation of dental service to coming medical care programs, Mr. Nevin points out that dentistry has never been as well sold as medical services which, in public opinion, are synonymous with health care. At present dentistry serves less than one-fourth of our people. Therefore, if tomorrow, dentistry were made everybody's free right through a compulsory health insurance program, it would be difficult to determine how many more dentists would be required. An extensive educational campaign would be required before dentistry would be accepted in such a plan as medical care. The author further points out that when dentists begin on this belated planning, the lack of which may already have prejudiced dentistry unfavorably for a long time in the future, the dentists must reëxamine the relation between "adequate" and "cosmetic" dentistry, as well as present dental economics whereby the dentist's livelihood comes not so much from his professional skill as from his middleman's profit from prosthetic dentistry.

PUBLIC MEDICAL CARE IN A PUBLIC AFFAIRS PAMPHLET

Readers will be glad to have Professor Winslow's "Health Care for Americans," the latest Public Affairs Pamphlet, published in May. Here is a succinct statement by a noted public health leader of the extent to which citizens of the United States lack medical care and of the kind of national health program that will fill the need.

The findings of the Committee on the Costs of Medical Care are summarized and illustrated with pictographs indicating that one-third of the people lack adequate medical care, two-fifths adequate dental care. The contribution of Blue Cross plans and voluntary health insurance to the development of a national health program is assessed and given full recognition.

Professor Winslow summarizes the Principles of a Nation-wide Health Program adopted by the Health Program Conference of 1944, made up of 29 of the leading experts in the field of medical care—13 physicians, 6 economists, 2 labor representatives, and 8 administrators of official or voluntary health agencies. Reviewed also is the 1944 official statement of the American Public Health Association, Medical Care in a National Health Program. Both stress the need for complete medical care—preventive, diagnostic, and curative—for all the people.

The publication of this pamphlet is testimony, if any were needed, that a national program of medical care has

come out of the area of philosophic discussion into that of practical planning for ways and means.

A NEW FIRST—MASSACHUSETTS HEALTH WEEK

Dr. Vlado A. Getting, Health Commissioner of Massachusetts, sends news of the State's first Annual Health Week celebrated from May 7 to 12. A rallying program was held as physicians, nurses, dentists, and other health and civic groups banded together to bring home to the public the vital need for the positive maintenance of good health as a means of fighting off disease and preventing unnecessary illness.

As proclaimed by Governor Maurice J. Tobin, the week was devoted to a Medical Day, Dental Day, Community Health Day, Public Health Day, School Health Day, and a Hospital Day, the last coinciding with National Hospital Day.

News releases, pictures, radio broadcasts, spot announcements, and other media helped carry the health message. Labor and industrial groups, school children, women's clubs, boards of health, the Army and Navy, Red Cross, dental, medical, public health, and other groups helped stimulate activities and promote observance on a local level.

A total of 25,000 Gubernatorial proclamation posters was displayed throughout the state and at least twenty radio broadcasts featuring prominent health personalities were given, not to mention sustaining programs which helped carry health information to home-makers and other regular audiences.

Among the material distributed was a pink pamphlet humorously illustrated and titled "Are you Being Misled? Vitamin Pills. Facts vs. Fads," and "Introducing You To" which includes a map of the state showing the eight state districts, together with information on the services available from the state districts in coöperation with local health officers.

PUBLIC HEALTH MANUAL OF THE U. S. JUNIOR CHAMBER OF COMMERCE

The Public Health Committee of the U. S. Junior Chamber of Commerce has recently published a manual of public health through the auspices of the Public Health Committee, of which Alfred E. Kessler, M.S.P.H., of Denver, is Chairman.

This manual outlines several possible approaches which the local Junior Chambers of Commerce can undertake to improve the health of their communities. The first suggestion relates to an evaluation of the health department made in coöperation with the Committee on Administrative Practice, American Public Health Association, and the *Evaluation Schedule*. Other chapters include a men's hospital volunteer corps, a program of industrial mental health, a venereal disease program, a proposal for sex education for boys and girls, a program of Red Cross activities, a project for tuberculosis control, a venture in post-war medical planning, programs in rat control, on health education through the radio, on sanitary food inspection, on physical fitness in industry, and on child dental health.

This is the most comprehensive and ambitious program of any of the national organizations of the luncheon club type. The Junior Chamber and its Health Chairman, Mr. Kessler, are to be congratulated on this publication which was made available through the interest and support of the Minneapolis-Honeywell Company.

BRITISH COLUMBIA REVISES ITS SCHOOL ROUTINES

Credit Lines is indebted to George M. Wheatley, M.D., Secretary of the A.P.H.A. School Health Section for the following:

"I have just had the good fortune to see the 31st, 32nd, and 33rd reports of the Medical Inspection of Schools for the years 1942, 1943, and 1944 of the Province of British Columbia as reported by Dr. G. F. Amyot, Provincial Health Officer. Public health workers and school officials should see this report. It reviews the steps taken to reorganize the school health service to meet war conditions and describes the changes in school health policies which have occurred in British Columbia since 1911. Administrators of school health service will want to read about the recent revision of records and report forms and the rôle that the school health service now plays in the community health program.

"Among the developments reported is a new method of reporting physical status. This is a wholesome departure from the traditional statistics on physical defects. Each child's general condition or physical status may be classified under three major groups, A, B, and C. For each of these three major groups are two sub-classifications indicated by d or e, depending upon whether the child has a physical *d*efect or an unsatisfactory *e*nvironmental factor is present. For example, a child classified as 'A' is one who enjoys an average satisfactory state of health. If a child is classified as 'Ad,' this denotes an average satisfactory state of health, with a slight physical defect which does not affect his general health. When a child's physical condition is classified as 'Ae,' it denotes a good average condition of health in spite of an unsatisfactory environmental factor. When a child's condition is classified as 'Bd' this denotes a moderate impairment of health due to some physical defect in the pupil. Classification of 'Ce' denotes a condition much below par due to external causes which might include heredity as well as environment. This new system has been in operation for about two years. Dr. Amyot reports that the bulk of the school children in the Province have been placed in the first two physical status classifications. Approximately 49 per cent in Grade 'A' and approximately 35 per cent in Grade 'Ad.' He states that 'the percentage of children placed in physical category "A" shows a steady rise from 37 per cent in Grade 1 to 60 per cent in Grades 10–13 inclusive. The pupils in physical category "Ad" show a steady decline from 42 per cent in Grade 1 to 27 per cent in the higher grades.' Dr. Amyot is inclined to believe that this improvement in physical status is due to the work of the Health Units and public health nursing services throughout the Province, although he cautions that these percentage figures should not be used too literally. The apparent improvement in physical status may be because the school medical examiners were using a new system and were not entirely familiar with its implications. Urban municipalities in general show a somewhat lower percentage of pupils of 'A' classification for all grades and a significantly higher percentage of pupils in 'Ad' classification than do rural areas.

"In short, Dr. Amyot has given us one of the most intelligent reports on school medical service that we have seen in some years. It reminds us of the valuable reports on school medical service which prior to the war we received from the Chief School Medical Officer of Great Britain."

LORAIN COUNTY, OHIO, CELEBRATES 25 YEARS OF THE HEALTH DEPARTMENT

The 25th anniversary of the establishment of the Lorain County District Health Department was celebrated in Oberlin on May 7 with a dinner at which the principal address was made by William A. McIntosh, M.D., of the staff of the International Health Division, Rockefeller Foundation. His

offices are now in Toronto. W. R. Morrison, M.D., Oberlin, is President of the Board of Health and F. W. Vincent, M.D., the Acting Health Commissioner.

During these years, in addition to Dr. McIntosh, health commissioners in Lorain County included I. C. Riggin, M.D., now State Health Officer of Virginia, C. D. Barrett, M.D., now Director of the Ingham County, Michigan, Health Department, H. R. O'Brien, now Senior Surgeon, Reserve, U. S. Public Health Service at the UNRRA office in Sidney, Australia, F. R. Dew, M.D. (now deceased), and L. E. Kerr, M.D., Surgeon (R), U. S. Public Health Service.

The annual report of the department is built around this event and is worth acquiring by any who may be planning similar occasions.

MORE ABOUT ANNUAL REPORTS

The Chicago Council of Social Agencies has tried a new type of annual report which it calls "The Marching Year of 1944: A Pageant in Twelve Months." In twelve brief pages it reports, month by month, headline news of its various activities—programs started as well as aims accomplished. That the Council lives in the modern world is attested to by such notes as:

Labor representative talks to the Publicity Council on "Labor-Welfare Participation—A Two-Way Street" . . . We spend a pleasant and profitable Sunday in conference with representatives of organized labor discussing labor-welfare coöperation in community planning . . . Our Committee on Organized Labor and Community Planning carries on through the summer . . . The Health Division requests organized labor to suggest representatives to serve on several important Committees . . . Clinics begin statistical reporting of nutrition services . . . The Clinic Nutritionists visit neighborhood stores to get a line on prices . . . Planning also goes forward on better dental service for children . . . We complete a plan for dental care for preschool children . . . Our survey of personnel practices and salaries, covering 5,583 employees and 155 agencies, is released . . . Inter-racial tension rises. Agencies represented on our Committee on Minority Groups begin to study their own practices, and our Publicity Council carries on its "work-shop" project on "what a public relations program can do about race prejudice" by discussing examples of prejudice and discrimination in our own agencies . . . The Chicago Housing Authority asks our help in meeting the urgent need of its Negro tenants for hospital care . . . The Cook County Bureau of Public Welfare asks our help in securing care for wives and infants of Negro service men in hospitals of their own choice. We plan with the Hospital Council to increase the number of beds available for this purpose. . . .

In presenting the report the Council says, "We might have told this story by departments, but that would put the emphasis on the mechanics of our work. We might have told you only of completed business, but much that we do is never finished—as a tree is never finished, or a city, or anything that lives and grows."

NEW HAVEN HOUSING AUTHORITY

The sixth annual report of the Housing Authority of the City of New Haven, recently published, is an excellent example of a meaningful report by a public body to its constituency. With pictures, charts, and good typography, it tells what the Authority has done in providing public housing, how rents have been related to income and how taxes have been affected in the six years of the Authority's existence.

Two-thirds of the report deals with the problem of the future. With a scholarly analysis of population trends,

housing and related conditions, and of the possible areas for rebuilding, this section constitutes a basic document in city planning as well as in the implementation of the hygienic ideals that have been developed for housing of today—and tomorrow.

HOME ACCIDENT FATALITIES INCREASE AMONG PRESCHOOL CHILDREN

If further reason were needed to justify the emphasis on home safety as an activity of health departments by the Subcommittee on Accident Prevention of the A.P.H.A.'s Committee on Administrative Practice, this headline in the February issue of the Metropolitan Life Insurance Company's *Statistical Bulletin* would furnish it. A two-fifths rise in the death rate from home accidents among boys and girls 1 to 4 years of age in the three years 1942–1944 over the three pre-war years 1939–1941 is startling news. The most frequent causes of 2,500 home accident fatalities in 1942 were burns or scalds which accounted for more than one-half, ingestion of poison compounds was second with 14 per cent, and falls were third with 10 per cent. These suggest a host of preventive measures; putting kitchen equipment in proper condition, keeping matches out of reach, cleaning and organizing the family medicine chest and keeping insecticides, cleaning fluids and other poisons under lock and key, anchoring rugs or loose stair steps, and guarding low windows. A whole program for a committee on home accidents could be built on this one article were there not a wealth of other data to give point to this coöperative venture with the National Safety Council.

NEGRO PHYSICIANS IN THE UNITED STATES

The January *Bulletin of the History of Medicine* has "An Account of Physicians of Color in the United States," by Col. M. O. Bousfield, M.C. Col. Bousfield is a Fellow of the A.P.H.A. and was Assistant Director of Medical Services of the Julius Rosenwald Fund until called to the Army early in the war. His article is an exciting story of Negro medical education and of the Negroes who became great doctors in spite of prejudice, ridicule, and closed doors.

MILK, FOOD AND RESTAURANT SANITATION

The Sanitary Engineering Division of the U. S. Public Health Service continues its useful aid to sanitation education. At hand are two lists from the Milk and Food Section, one of films relating to milk and food sanitation classified as to audience for which designed, and another of references on restaurant sanitation which methodically cover the literature from 1920 or thereabout to date.

COMMERCE SPEAKS UP FOR THE LOCAL HEALTH OFFICERS

Sealright (sanitary paper milk bottle hoods) sends us an interesting brochure of copies of a baker's dozen of ads in recent issues of *Collier's*, *Life*, *Time*, and *Saturday Evening Post*. With appropriate classical quotations such as Emerson's "The first wealth is health," the series tells the story of the local health officer—how he has conquered diphtheria, tracks down hidden sources of infection in the environment, and adjusts his techniques to the changing sources of health dangers. The sign-off line is always, in one form or another, "Your local health officer needs and deserves your support." Some of the advertisements were published in the *Journal*.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. *Part I. Nature and Uses of the Method—By the Committee on the Hygiene of Housing, A.P.H.A. New York, A.P.H.A.*, 1945. 71 pp. Price, $1.00.

When the Committee on the Hygiene of Housing was created it marked one of the milestones in the recognition of housing as a positive factor in raising "the physical and emotional and social vigor and efficiency and satisfaction" of the population. The committee has contributed significant analyses in this field, all tending to clarify concepts of good and bad housing and to isolate the significant characteristics of such structures. Throughout its activities it was early aware of the fact that true progress in amelioration of our multiple housing difficulties would be largely made only when appropriate tools of objective measurement could be made available. The layman may feel that his concept of "bad housing" is sufficient for law enforcement, for city planning, for demolition, for subsidy, for rent control, etc. The investigator, however scientific in his approach, has always been confronted with a motley of qualitative criteria, many of which were frequently competitive with each other, some of which were unreasonable and arbitrary and few of which had been adequately standardized for measurement, as in other fields of private and public activity, such as water supplies, dairies, food establishments and the like.

The present publication represents a brief summary of the results of the committee's important activities during the past four years in the preparation of such tools. It believes that it has devised a technique for inspecting and evaluating the health qualities of housing, which is simple, objective, and susceptible to wide application under technical supervision.

It recommends the substitution of such an objective appraisal of the dwelling and of its environment for the qualitative and frequently emotional criteria which have so often prevailed in the past.

By such a standardized procedure the committee offers likewise a basis of comparison between areas, between communities, between rental classifications or any other fields in which comparison is essential for intelligent policy and action.

In a city such as Baltimore for example, the standards and procedures of the health department, the building department, the fire department, the city plan commission and other agencies are all different. The common language which is one of the first prerequisites to mutual understanding has not yet been evolved. The same situation prevails in virtually every important city in the United States.

The instrument which is described in this publication is one which should be welcomed by all private and official agencies interested in moving forward on a common base in this post-war field of transcending importance. No one doubts that housing construction after the war will sweep the United States,

carrying with it, as the committee properly points out, "vast opportunities for bringing men, materials and machines together to create durable wealth and social gain." Any intelligent operation in the field should and must rest upon the application of reasonable criteria of what we mean by acceptable and unacceptable housing.

The monograph provides an appraisal form for such purposes and a detailed application of such an appraisal form to the City of New Haven, Conn. Every worker in the field of public health should give careful study to the document. It is one of the major contributions to translating opinions into objective measurement in one of the most difficult fields of appraisal. Every health officer should introduce it as promptly as possible to all of his coworkers throughout the United States, so that his conclusions may be matched by the same units of measurement with those of the building department, the fire department, the city plan commission, the department of welfare, the law department, and all other agencies, private or public, whose common purpose is the elimination of slums, blighted areas and substandard dwellings for every sector of the population.

ABEL WOLMAN

Tuberculosis in the United States, Graphic Presentation, Vol. 2—*By Medical Research Committee, National Tuberculosis Association. New York: National Tuberculosis Association,* 1944. 126 pp. Price, $1.50.

This second volume on tuberculosis in the United States, prepared under the direction of Carroll E. Palmer, is the result of a fruitful coöperative undertaking of the National Tuberculosis Association and the U. S. Public Health Service, utilizing most effectively basic data made available by the U. S. Bureau of the Census.

There is stated for each state, first, in tabular form the percentages which tuberculosis deaths were to deaths from all causes by age, sex, and color during the 3 year periods 1939–1941, 1929–1931, and 1919–1921. Second, all of these data are separately and clearly charted. The salient aspects of tuberculosis in every part of the country are thereby effectively brought out, and the entire work is pregnant with practical indications as to where and among what groups health authorities and agencies may best concentrate anti-tuberculosis work.

Thus we see among whites that the percentage of tuberculosis deaths to deaths from all causes during the 3 year period 1939–1941 varied all the way from 1.8 in Utah to 12.7 in Arizona, and among non-whites from 3.4 in South Carolina to 10.0 in California. Likewise it was found for the entire United States that 14.2 per cent of all the deaths among white men in the important age group 30–34 were due to tuberculosis; among white young women 20–24 it rose to 22.9 per cent. Further, among colored men 20–24, the percentage of tuberculosis deaths was 28.8 and, among colored girls 15–19, it was as high as 37.9.

The authors of this compendium have carefully pointed out that, while specific mortality rates are the most dependable measures, there is need during intercensal periods of a usable index of the trend and current changes in tuberculosis independent of population enumerations. And "the present volume is intended to provide a base-line for the study of changes in tuberculosis mortality by means of proportionate mortality."

During the 3 years 1939, 1940, and 1941, there were still recorded 181,385 deaths from tuberculosis in the United States and 307,956 new cases were registered. The present study by the U. S. Public Health Service and the National Tuberculosis Association is a

practical contribution in the daily fight against the disease.

The report is so well done on a statewide level that it is to be hoped something similar might be done, with deaths corrected this time for residence and with information for Negroes separate from that for other non-whites, for the larger cities of the United States where tuberculosis prevails at much higher rates.

GODIAS J. DROLET

Mass Radiography of the Chest—*By Herman E. Hilleboe, M.D., and Russell H. Morgan, M.D. Chicago: Year Book Publishers,* 1945. 288 pp. Price, $3.50.

The development of equipment for the x-ray examination of large groups of individuals at a reasonable cost has provided public health workers and phthisiologists with the most practical means for the early diagnosis of tuberculosis since the original discovery of the x-ray. Although photofluorography of the chest has been practicable only a few years, the numbers of individuals x-rayed with this method has already reached into the millions, with every indication that when the production of this type of equipment for civilian use is resumed, even larger numbers will be reached.

This small volume covers all phases of mass x-ray surveys, from the preliminary planning, through the detailed routine to be followed during the actual survey, to the study and care of the persons found to have x-ray evidence of pulmonary disease. All types of equipment are discussed, including 35 mm, 70 mm, and 4 x 5 in. x-ray films as well as 14 x 17 in. sensitized paper. In the consideration of the relative merits of each of these media, the authors avoid the error too often made in the literature of over-enthusiasm regarding the relative accuracy of the small films. They recognize that these films have a definite margin of error, particularly in the diagnosis of minimal tuberculous lesions, but point out that in spite of this, photofluorography is unexcelled in the x-ray examination of large numbers of individuals at low cost.

A large part of the book is devoted to a very lucid, somewhat detailed description of the various types of equipment and the factors involved in their choice and operation. The roentgen diagnosis of diseases of the chest is considered, with 48 full-page reproductions of x-ray films to illustrate some of the types of pulmonary pathology found.

The subject matter is presented clearly and the book should serve as an excellent reference work for public health workers interested in mass chest x-ray surveys, particularly for those with some technical training or interest.

ROBERT E. PLUNKETT

Microbial Antagonisms and Antibiotic Substances—*By Selman A. Waksman. New York: The Commonwealth Fund,* 1945. 350 pp. Price, $3.75.

The rapidly expanding literature on antibiotics has been greatly in need of an enlarged review to enable those not specializing in the field to keep abreast of the developments. The need is well met by this book. The author has made a very complete coverage of the literature and accumulated a bibliography of 1,016 references. His point of view, that of a soil microbiologist, is made quite apparent in the early chapters, where the fundamental background material of the subject is given. While it would be desirable for everyone concerned with the subject to be familiar with the material in this book, it is written for the research worker. The section dealing with the interests of the public health worker is a relatively small part. The author discusses the possibilities of further developments in the field.

The reviewer would recommend it as an excellent book for the reference shelf. G. A. LEPAGE

Higiene y Salud Publica—*By Charles Fredcrick Bolduan, M.D., and Nils William Bolduan, M.D. (3rd ed. rev.) Translated by Clare H. de Kirk. Bogota, Colombia: Editorial Antena,* 1943. 268 pp.

This is a translation of the third revised edition (1941) of the Bolduans' *Public Health and Hygiene.* It enters a field as yet barely touched, that of texts in Spanish on public health, and should be a valuable contribution. It is a pity that wartime shortages did not permit the volume to appear in as good a printing as its English counterpart. The binding and the paper are such that the photographs and some of the cuts could not be reproduced. Particularly to be lamented is the plate of the course of eruption in vaccination, and the plate of the malarial parasites.

Since the English text was written in 1941, there is naturally an omission of the more recent developments, such as: gamma globulin in measles control, and penicillin for syphilis and gonorrhea. The statement that tuberculosis case finding among adolescent children "should usually consist of two steps, namely, a proper Mantoux test and subsequently an x-ray examination of the positive reactors" might be challenged now by proponents of the inexpensive miniature films.

The volume presents clearly in simple form without detail, public health practice in the United States and as such should be of value to college students and nurses, though it will need to be supplemented by a consideration of local conditions. The Spanish text is not colloquial and on occasion shows the effect of literal translation. It is written in a much more direct style than original Spanish would be, but is always understandable. There still exists a great need in Latin America for a comprehensive reference book on public health in Spanish that deals with the problems found in those countries and that considers administrative practices and available facilities there.

The Bolduans are to be congratulated on having made their volume available to our Spanish speaking neighbors and it is to be hoped that it may serve as a stimulus to develop what is truly needed. JEROME S. PETERSON

Nursing in Prevention and Control of Tuberculosis—*By H. W. Hetherington, M.D., and Fannie Eshleman, R.N. (rev. ed.) New York: Putnam,* 1945. 332 pp. Illus. Price, $3.00.

The revised edition of this universally known and used book is welcome. Miss Eshleman has again included her presentation of nursing care of the tuberculous patient in home, hospital, and clinic, and the chapters on collapse therapy and the prevention of tuberculosis among nurses which are so frequently quoted. Fresh material on rehabilitation and a new case history have been added.

However, one looks in vain for recent references to the effect of war on tuberculosis and nursing policies, to the use of chemotherapy, new theories as to rest, and developments in governmental interest in the control of this disease. There is a dearth of references to publications and developments in the field as a whole since 1941. A reëdition of the earlier book would be a better description of it than to call this book a revision. Nevertheless, it is still one of the best presentations we have of nursing in tuberculosis.

DOROTHY DEMING

Physical Growth from Birth to Two Years: I. Stature. *A Review and Synthesis of North American Research for the Period 1850–1941—By*

Howard V. Meredith, Ph.D. Iowa: University of Iowa Press, 1943. 337 pp. Price: Cloth bound, $1.75; Paper bound, $1.50.

Data on growth appear in so wide a range of surveys and investigations that those interested in the field will welcome the review presented in this monograph. It is divided into two parts, of which the first is an attempt to synthesize material in the literature. The author emphasizes that " the scope of the study is restricted anthropometrically to stature, chronologically to the first two postnatal years, geographically to North American research and secularly to investigations reported before 1942." Within these limitations the data available are examined with regard to secular differences, race, sex, geographic location, socio-economic status, parity, age, and stature of mother, prematurity, disease and diet.

Among the conclusions apparently justified from the literature is the upward secular trend in the past 50 years. The gain in stature is slight at birth, of the order of 0.5 cm., but amounts to as much as 4 cm. at 1 to 2 years. Analysis of racial differences inevitably brings up the question of the relative influences of genetic and environmental factors. At birth, white infants appear to exceed Negro infants by " roughly half an inch," yet when the two groups are given like diets, the Negro is no shorter than the white at age 2 years.

The author is very cautious about drawing conclusions from the data related to socio-economic differences in view of the difficulty in defining criteria for different levels and evaluating the influence of medical guidance and supervision. The closely related question of diet is analyzed only postnatally and from the limited questions of influence of human versus cow's milk (no apparent difference), vitamin D supplement (some differences), and vitamin B complex and mineral supplement (no apparent difference). Recent work of Tisdall and Ebbs in Toronto, and Burke and Stuart in Boston, indicates that differences do exist at birth related to the maternal diet prenatally, and diet is obviously influenced by " socio-economic status."

The second part of the monograph consists of an annotated bibliography of 130 papers published prior to 1942.

The author's efforts have been detailed and painstaking, and the monograph should prove invaluable to research workers and to all those concerned with the care and supervision of infants. It is unfortunate that its usefulness for the average physician and nurse engaged in child hygiene will be impaired by the profusion of unnecessarily complicated statistical terms. A sentence like—" In each instance the significance ratio was found to exceed the critical value required for confident rejection of the null hypothesis at the 1 per cent level " succeeds merely in burying a relatively simple fact in a mass of words, unintelligible to anyone without considerable training in theoretical statistics. This shortcoming should not, however, deter interested persons from reading and using this monograph. MYRON E. WEGMAN

Occupational Accident Prevention —*By Harry H. Judson and James M. Brown. New York: Wiley*, 1944. 234 pp. Price, $2.75.

This book, which is addressed primarily to members of the supervisory staffs of industrial organizations, contains a non-technical presentation of the more important factors which have proved effective in the control of occupational accidents. It is based upon notes originally developed by the authors for their use in conducting courses in industrial safety engineering under the Engineering Science and Management War Training Programs. The book emphasizes the necessity for

management leadership in industrial safety programs and stresses the fact that effective accident prevention results in increased production, decreased production costs, and the elimination of production interruptions.

The various factors discussed by the authors are classified in three major groups, namely: "The Improvement of Work Procedures," "The Improvement of the Plant," and "Safety Activities." Under these headings the material is presented as a guide to supervisors in recognizing the various accident problems of industry and in exercising effective leadership in the control of these problems.

In the first group, the authors discuss methods of preventing falls and accidents incident to handling materials, and the use of hand tools. They also emphasize the importance of plant housekeeping, plant maintenance, personal protective equipment, and programs to train and maintain the interest of employees.

In the second group, the authors discuss the need of determining accident causes and of investigating current accidents, and outline methods of improving plant conditions through proper layout, illumination, mechanical guarding, removal of electrical hazards, fire prevention and fire extinguishing.

In the third group, the discussion of safety activities starts with a brief outline of the purposes of compensation laws. Among the activities which have proved effective in reaching the employees with the safety message, the authors discuss safety organization, plant inspection, first aid facilities and instruction. Reference is also made to accident standards and codes, and to the selection and purchase of safety equipment. W. GRAHAM COLE

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.

AMERICAN EDUCATION IN THE POSTWAR PERIOD. Part I—Curriculum Reconstruction. 44th Yearbook. National Society for the Study of Education. Chicago: University of Chicago Press, 1945. 297 pp. Price, cloth $3.00, paper $2.25.

AN INDEX OF DIFFERENTIAL DIAGNOSIS OF MAIN SYMPTOMS. By various writers, edited by Herbert French, C.V.O., C.B.E., M.A., M.D. Oxon, F.R.C.P. 6th ed. Baltimore: Williams & Wilkins, 1945. 1128 pp. Illus. Price, $17.00.

ANIMAL COLONY MAINTENANCE. By Edmond J. Farris, F. G. Carnochan, C. N. W. Cumming, Sidney Farber, Carl G. Hartman, Frederick B. Hutt, J. K. Loosli, Clarence A. Mills and Herbert L. Ratcliffe. New York: New York Academy of Sciences, 1945. 126 pp. Price, $1.50.

THE BACTERIAL CELL. In Its Relation to Problems of Virulence, Immunity and Chemotherapy. By René J. Dubos. Cambridge: Harvard University Press, 1945. 460 pp. Price, $5.00.

BETTER TEACHING THROUGH TESTING. A Practical Manual for the Physical Education Teacher. By M. Gladys Scott, Ph.D., and Esther French, Ph.D. New York: Barnes, 1945. 247 pp. Price, $2.50.

THE CHEMICAL FORMULARY. A Collection of Valuable, Timely, Practical Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry. Vol. VII. Editor-in-chief, H. Bennett. New York: Chemical Publishing Co., 1945. 474 pp. Price, $6.00.

CINCHONA IN JAVA. The Story of Quinine. By Norman Taylor. New York: Greenberg Publishers, 1945. 87 pp. Price, $2.50.

COMMON AILMENTS OF MAN. Edited by Morris Fishbein, M.D. Garden City: Garden City Publishing Co., 1945. 177 pp. Price, $1.00.

CONSERVING THE HEALTH OF COLORADO'S CHILDREN. A Handbook for Teachers. Denver: Department of Education and Division of Public Health, 1944. 247 pp. Price, $1.00.

THE DENTIST AND HIS PATIENT. Correlating Diagnosis and Treatment Planning with Patient Education and Practice Management for Optimum Control of Dental Disease. By David Friend, George D. Kudler, D.D.S., Myron M. Lieb, D.D.S., Robert Ritt, D.D.S., and Arthur A. Friend, D.D.S. New York: Revere Publishing Co., 1945. 480 pp. Price, $10.00.

DISINFECTION AND STERILIZATION. By Ernest C. McCulloch, D.V.M. 2nd ed. Philadelphia: Lea & Febiger, 1945. 472 pp. Illus. Price, $6.50.

ESSENTIALS OF HISTOLOGY. By Margaret M. Hoskins, Ph.D., and Gerrit Bevelander, Ph.D. St. Louis: Mosby, 1945. 240 pp. 135 illus. Price, $3.50.

FLUORINE IN DENTAL PUBLIC HEALTH. A Symposium. By Frederick S. McKay, D.D.S., H. Trendley Dean, D.D.S., Wallace D. Armstrong, Ph.D., M.D., Basil G. Bibby. Ph.D., M.D., and David B. Ast, D.D.S. New York: New York Institute of Clinical Oral Pathology, 1945. 62 pp. Free from publisher.

GUIDE TO GUIDANCE. Vol. VII. A Selected Bibliography of 1944 Publications of Interest to Deans, Counselors, Advisers, Teachers, and Administrators. Edited by M. Eunice Hilton, Ph.D. Syracuse: Syracuse University Press, 1945. 62 pp. Price, $1.00.

HANDBOOK OF PRACTICAL BACTERIOLOGY. A Guide to Bacteriological Laboratory Work. By T. J. Mackie, M.D., and J. E. McCartney, M.D. 7th ed. Baltimore: Williams & Wilkins, 1945. 720 pp. Price, $5.00.

MARRIAGE AND FAMILY COUNSELING. A Manual for Ministers, Doctors, Lawyers, Teachers, Social Workers, and Others Engaged in Counseling Service. By Sidney E. Goldstein. New York: McGraw-Hill, 1945. 457 pp. Price, $3.50.

MEDICAL NURSING. By Amy Frances Brown, R.N. Philadelphia: Saunders, 1945. 579 pp. 153 illus. Price, $2.75.

MEN UNDER STRESS. By Roy R. Grinker, Lt. Col., M.C., and John P. Spiegel, Major, M.C. Philadelphia: Blakiston, 1945. 484 pp. Price, $5.00.

PROFESSIONAL NURSES. THE OUTLOOK FOR WOMEN IN OCCUPATIONS IN THE MEDICAL SERVICES. Bulletin 203, No. 3. Washington, D. C.: Women's Bureau, U. S. Department of Labor, 1945. 61 pp.

REPORT OF THE SANITATION SERVICES OF THE BUREAU OF LABORATORIES FOR 1943. Hartford: Connecticut State Department of Health. 24 pp. Free from publisher.

STOOL AND URINE CULTURES FOR ENTERIC DISEASE ORGANISMS. Bureau of Laboratories Approved Method EN-1. Hartford: Connecticut State Department of Health, 1945. 34 pp. Free from publisher.

A SECOND LIST OF PUBLICATIONS ON DDT. By R. C. Roark. Washington, D. C.: Department of Agriculture, 1945. Pub. No. E-660. 27 pp. Free from publisher.

SELECTED BIBLIOGRAPHY ON MEDICAL ECONOMICS. By Helen Hollingsworth and Margaret C. Klem. Bureau Memo. No. 60. Washington, D. C.: Social Security Board, Bureau of Research and Statistics, 1944. 21 pp. Free from publisher.

STATISTICS OF MEDICAL SOCIAL CASEWORK IN NEW YORK CITY, 1944. By Ralph G. Hurlin. New York: Russell Sage Foundation, 1945. 21 pp. Price, $.25.

SYLLABUS OF AUDIOMETRIC PROCEDURES IN THE ADMINISTRATION OF A PROGRAM FOR THE CONSERVATION OF HEARING OF SCHOOL CHILDREN. Supplement to the Transactions of the American Academy of Ophthalmology and Otolaryngoly. Edited by Horace Newhart, M.D., and Scott N. Reger, Ph.D. Rochester, Minn.: American Academy of Ophthalmology and Otolaryngology, 1945. 28 pp. Price, $.25.

TEXTBOOKS OF HEALTHFUL LIVING. By Harold S. Diehl, M.D. 3rd ed. New York: McGraw-Hill, 1945. 707 pp. Price, $2.50.

SCIENCE YEAR BOOK OF 1945. Edited by John D. Ratcliff. Garden City: Doubleday, Doran, 1945. 224 pp. Price, $2.50.

TUBERCULOSIS IN THE UNITED STATES. Graphic Presentation. Vol. 2. Proportionate Mortality Statistics for States and Geographic Divisions by Age, Sex and Race. Prepared by the staffs of the Division of Public Health Methods and the Tuberculosis Control Division, U. S. Public Health Service under the direction of Carroll E. Palmer, M.D. New York: National Tuberculosis Association, 1944. 126 pp. Price, $1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Speaking of Lohengrin—Prospects of marriage are the same for the bachelor of 30, the widower of 40, and the male divorcee of 45—and they are 2 in 3. The spinster of 30, the widow of 33, and the divorcee of 45 all have a 1 in 2 chance of marrying. These are but two of several eye-opening findings that should furnish you a half hour of amused or bemused reflection if you are given to speculating on the ways of a man with a maid.

AXON. The Chances of Remarriage for the Widowed and Divorced. Stat. Bull. (Met. Life Ins. Co.). 26, 5:1 (May), 1945.

"Trichikinosis Is a Form of Diarrhea"—So said the teacher. Boston's soiled school health educational linen is washed in public by the Strayer Committee, because other cities, too, could do with a little laundering.

AXON. Standards for a School Health Program. J. School Health. 15, 6:131 (June), 1945.

An Iconoclast on the Loose—This one is a must! A pediatrician takes apart a lot of accepted medical practices in his field, and gives you a close-up of the worn-out machinery. The hospital, he says, facilitates the work of the obstetrician but hampers that of the pediatrician. Then, here is another sample: "As between the chef and the dietitian, I choose the chef without reservation." Maybe you had better reserve your comment until you have read the paper which is loaded with eyebrow-raisers. Pray that someone equally gifted will do as thorough a job of veterinary surgery on our sacred cows of public health. And pardon the jumbled metaphors.

BAKWIN, H. Pseudodoxia Pediatrica. New England J. Med. 232, 24:692 (June 14), 1945.

Health in Collective Bargaining—Management has developed health and safety rules usually without consulting workers. Sometimes workers have used their union strength to oppose measures that would benefit them. Conditions are better nowadays even though there are still many companies and many unions whose activities show no evidence of consideration for the health needs of the worker. Into this noose the health official is invited to stick his innocent neck.

BLOOMFIELD, J. J. Labor-Management Relations in Industrial Health. J.A.M.A. 128, 9:639 (June 30), 1945.

Do Health Examinations Promote Industrial Efficiency?—One Hundred male industrial employees who have submitted to physical examinations over a fourteen year period were compared with a hundred who hadn't. It seems a shame to spoil this story by culling out the conclusions of this experience, so it shall be said here only that the findings do not entirely prove what you hope they would. The whole story should be read, for it is a good one.

BRISTOL, L. D. Value of Health Examinations in Industry. J.A.M.A. 128, 9:627 (June 30), 1945.

From Aristotle to ECG—Reviewing the history of man's accumulation of knowledge about the heart, the author of this scholarly paper concludes that the remaining problems center upon finding ways to sustain the performance of the heart muscle and to

maintain the health of the blood vessels through which nourishment is conveyed to it.

COHN, A. E. Disease of the Heart. Science. 101, 2628:471 (May 11), 1945.

Distribution of Polio in 1944—Higher than in any year since 1916, poliomyelitis struck down 19,053 Americans in 1944. (Indications are that the disease is going stronger this year than last.) This statistical study of last year's performance will prove useful for those who must face the coming epidemic.

DAUER, C. C. Incidence of Poliomyelitis in the United States in 1944. Pub. Health Rep. 60, 23:633 (June 8), 1945.

Forty Million Still Lack Health Services—Three essentials to permanent public health improvement are these: local health units for about 1,200 areas of jurisdiction; existing state jurisdiction and functions; federal services under a single directing head, and engaging in local activities only at the invitation of the state.

EMERSON, H. Larger Units of Local Health Jurisdictions Indispensable for National Health. South. M. J. 38, 4:276 (Apr.), 1945.

Individual and Community Immunity—Out of Halifax's tragic experience with virulent diphtheria come some lessons for us in luckier communities. One is that in the face of such an epidemic, it would be the part of wisdom to give all children a reinforcing dose of toxoid. Another is that health propagandists should be honest in their statements about protection afforded.

GIBBARD, J., *et al.* Some Observations on Diphtheria in the Immunized. Canad. Pub. Health J. 36, 5:188 (May), 1945.

Skin Tests—Probably the "Medical Progress" series of papers should be mentioned less frequently in this bibliography, for they are merely reviews. But this one, which collects and solidifies the latest scientific information on the skin tests for brucellosis, chancroid, and the whole alphabet of infectious diseases seems to be of especial interest to health workers.

KANE, L. W. Skin Tests in Bacterial and Viral Diseases. New England J. Med. 232, 25:728 (June 21), 1945.

Syphilis Epidemic—Though it is still true that epidemiologic investigations of syphilis cases may be productive, many health officials find it hard to credit the evidence. So this study of 25 named contacts of one lady of easy virtue should be brought to your attention if you are a Doubting Thomas, too.

MATTISON, B. F., and EARLE, H. H. An Outbreak of Early Syphilis in Western New York State. New York State J. Med. 45, 10:1105 (May 15), 1945.

Made in Detroit—You will find much of interest in this description of a field-and-hospital coördination program by which health department nurses carry out the group instruction and individual guidance for maternity, tuberculosis, and communicable disease patients in the hospital.

RYER, I. It Takes Imagination and Courage. Pub. Health Nurs. 37, 5:252 (May), 1945.

Sign of the Times—You will be interested to learn that 15 little girls were cured of gonorrheal vaginitis with one dose of penicillin. The sixteenth child required additional divided doses. Hospitalization is unnecessary—a far cry from the earlier day's regimen.

SAKO, W., *et al.* One Dose Penicillin Treatment of Chronic Gonorrheal Vaginitis in Children. J.A.M.A. 128, 7:508 (June 16), 1945.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

F. Kenneth Albrecht, M.D., State Health Dept., Jefferson City, Mo., Director of Tuberculosis Control Division

David E. Price, M.D., M.P.H., 615 N. Wolfe, Baltimore 5, Md., Senior Asst. Surgeon, U. S. Public Health Service

Arthur V. Turner, Dept. of Health, Lyndhurst, N. J., Health Officer and Registrar of Vital Statistics

Laboratory Section

Emiliano Armijo, M.D., Andres Bello 80, Santiago, Chile, S. A., Prof. of Bacteriology, Escuela de Salubridad, Universidad de Chile

Pvt. Gino A. Curreri, Medical Laboratory Technician, General Hospital

August Holm, Sc.D., E. R. Squibb & Sons, New Brunswick, N. J., Bacteriologist

Joseph C. McCaffrey, M.P.H., 611 Lakeview Terr., Glen Ellyn, Ill., Bacteriologist IV, State Dept. of Public Health

Paulo Mello-Freire, M.D., Caixa Postal 26, Mogi das Cruzes, Estado de Sao Paulo, Brazil, S. A., Student, Yale Univ., New Haven, Conn.

Katherine Parrotta, Bradford Hospital, Bradford, Pa., Chief Laboratory Technician

Vital Statistics Section

William H. Alban, 1008 City Hall, Houston, Tex., Registrar and Statistician, Houston City Health Dept.

Manuel A. Gonzalez, Box 245, Hato Rey, P. R., Chief of Statistics, Insular Police

Ethel Henshaw, Dade County Courthouse, Room 816, Miami, Fla., Director, Bureau of Vital Statistics, Dade County Health Dept.

Bronson Price, Ph.D., 4854 MacArthur Blvd., N.W., Washington 7, D. C., Vital Statistics Division, Census Bureau

Engineering Section

Eugene E. Atwood, USN Medical Research Unit No. 1, Berkeley, Calif., Sanitary Officer and Pharmacist

Jorge L. Colon, Jose I. Quinton, Coamo, P. R., Trainee for Sanitation Official, Dept. of Health

Sergio Cuevas, Box 2832, San Juan, P. R., Administrator and Chief Engineer, Aqueduct and Sewerage Service

Joseph L. Dermody, 2000 Massachusetts Ave., N.W., Washington, D. C., P.A. Engineer (R), U. S. Public Health Service

Milton E. Held, State Dept. of Health, Des Moines 19, Ia., Senior Milk Sanitarian

Louis R. Howson, C.E., 20 N. Wacker Drive, Chicago, Ill., Sanitary Engineer, Alvord, Burdick & Howson

Jens A. Jensen, Box 950, Goldsboro, N. C., P.A. Engineer (R), U. S. Public Health Service

Ramon E. Perez-Baerga, 39 Intendente Ramirez, Ponce, P. R., Sanitarian, Insular Dept. of Health

Eduardo Reyes-Segarra, 4 Machin St., Santurce, P. R., Sanitary District Engineer, Public Health Dept.

Jose A. Seraballs-Medel, Ave. Fernandez Juncos No. 43 altos, Santurce, P. R., Trainee, Insular Health Dept.

Enrique S. Vilella, Los Angeles No. 17, Ocean Park, Santurce, P. R., Health Official Trainee, Insular Dept. of Health

Industrial Hygiene Section

Allen N. Koplin, M.D., Rest Haven Motel, Box 941, Yakima, Wash., Clinic Medical Officer, War Food Administration

Food and Nutrition Section

Cleveland W. Duncan, Deerfield Packing Corp., Bridgeton, N. J., Supervisor of Farm Workers

Marguerite M. Krebs, 806 UB Bldg., Dayton T. O., Director, Dairy Council

Johan M. Latsky, Ph.D., Union Health Dept., Box 386, Pretoria, South Africa, Chief Nutrition Officer, Dept. of Public Health, Union of South Africa

Lillian L. Nash, M.D., 4715 N. Spaulding Ave., Chicago 25, Ill., Nutritionist, Cook County Public Health Unit

Maternal and Child Health Section

Ramon Aguiar-Nicto, M.D., Puente Restaurador, Avenida Miranda Letra H., Caracas, Venezuela, S. A., Medical Chief, Public Health Unit

Eleanor M. Murphy, Box 906, Dickinson, N. D., District Child Welfare Worker and Juvenile Commissioner, Public Welfare Board, Bismarck.

Julia Torres-Rodrigues, Dr. Veve No. 9, Bayamon, P. R., Senior Social Worker, Bayamon District Hospital, Dept. of Health

Public Health Education Section

Sanford Bates, State Office Bldg., Trenton, N. J., Commissioner, State Dept. of Institutions and Agencies

Elizabeth V. Cunningham, 45 Rockefeller Plaza, Room 3870, New York 20, N. Y., Asst. Director in charge of Health and Medical Films, American Film Center

Philo T. Farnsworth, Ph.D., 852 S. 6th E., Salt Lake City 2, Utah, Asst. Superintendent, Salt Lake County General Hospital

Ruth M. Harris, 615 E. 4th St., Charlotte, N. C., Exec. Secy., Mecklenburg County Tuberculosis Assn.

Thomas A. Hart, Ph.D., 2611 Lee Blvd., Apt. 202, Arlington, Va., Chief, Malaria Control Branch, Tropical Disease Control Division, Preventive Medicine Service, Surgeon General's Office

Noreen H. Heath, 3 Bermuda House, Reid St., Hamilton, Bermuda, School Nurse and Inspector of Midwives, Dept. of Public Health

Amanda E. Hendrickson, M.A., Box 264, Dickinson, N. D., Instructor, State Teachers College

Hiram A. Jones, Ph.D., State Education Bldg., Albany, N. Y., Administrative Director of Health and Physical Education, State Education Dept.

Anne G. Moore, R.N., 1551 Franklin Ave., Mineola, N. Y., Consultant Nurse, Nassau County Cancer Committee

Gracia Nadal-Grau, M.S., Betances No. 23, Aguadilla, P. R., Supervisor of Medical Social Workers, Dept. of Health

Eleanor Pearlman, 7602 Bay Parkway, Brooklyn, N. Y., Student, Yale Univ., Dept. of Public Health

Isabel Ramirez, 1000 E. Ann St., Ann Arbor, Mich., Student, Univ. of Michigan, School of Public Health

Mary B. Rappaport, R.N., M.A., State Education Dept., Albany 1, N. Y., Supervisor of Health Teaching

Albert N. Robinson, 103 Cherry St., Monroe, La., State Representative, The National Foundation for Infantile Paralysis

Ella J. Rose, Ph.D., University Farm, St. Paul 8, Minn., Home Economics Teacher

Eloy Santiago-Vega, Americo Salas No. 1, Stop 20, Santurce, P. R., Chief Counselor, Venereal Disease Hospital, Dept. of Health

Clement C. Swain, M.D., 129 N. Virginia St., Reno, Nev., Secy., Nevada Tuberculosis Assn.

Public Health Nursing Section

Lena Besendorfer, 115 S. State St., Salt Lake City 1, Utah, Public Health Nursing Supervisor, City Board of Health

Dorothy E. Clark, County Office Bldg., White Plains, N. Y., Instructor of Public Health Nursing, Westchester County Dept. of Health

Gertrude A. Koeneman, 213 W. Walnut, Harrisburgh, Ill., Supervising Nurse, Dist. No. 18, State Dept. of Public Health

Clio McLaughlin, R.N., State Board of Health, Jacksonville 1, Fla., State Tuberculosis Consultant

Martha R. Smith, M.A., R.N., 84 Exeter St., Boston, Mass., Prof. of Nursing Education, Boston Univ.

Asuncion Solis, R.N., San Rafael, Yabucoa, P. R., Public Health Nurse, Insular Dept. of Health

Flora R. Wakefield, Wake County Health Dept., Raleigh, N. C., Supervising Nurse

Robina Walters, Box 260, Dixon, Ill., District Supervising Nurse, Dist. 3, Dept. of Public Health

Epidemiology Section

Ahmed M. Kamal, Egyptian Public Health Assn., 8 Sheikh Hamzash, Cairo, Egypt, Director General, Dept. of Preventive Medicine

Dr. Pedro Rosado, Rua Manoel Barata No. 630, Para, Brazil, S. A., Medical Supervisor of Migration Program

Robert L. Smith, M.D., State Dept. of Health, Charleston, W. Va., Asst. Director, Bureau of Tuberculosis

Capt. Maxwell Stillerman, M.C., 3215 41st St., Long Island City, N. Y., Medical Officer, U. S. Army

Donald C. Tulloch, M.D., M.P.H., State Dept. of Health, Albany, N. Y., Asst. District State Health Officer

Antonio M. Vilches, M.D., M.P.H., Boyaca 33, Buenos Aires, Argentina, S. A., Epidemiologist, Virus Section, Instituto Bacteriologico

Allen E. Walker, M.D., Denver Rapid Treatment Center, Denver General Hospital, Denver, Colo., Medical Officer in charge

School Health Section

Zeta E. Bankert, M.S., 231 Mumford Hall, Columbia, Mo., Instructor in Rural Sociology, Univ. of Missouri

Robert H. Brown, M.D., 665 Melish Ave., Cincinnati 29, O., Clinic Physician, Cincinnati Health Dept.

D. Lenora Kirk, 34 Lenape Rd., Colwick, Merchantville, N. J., School Nurse, Folcroft and Glenolden School Districts

Aria C. Rosner, R.N., 1666 Detroit St., Denver 6, Colo., School Nurse, Denver Public Schools

Vicente Roure, Jr., M.A., Bradway 51, Box 28, Hato Rey, P. R., Supervisor, Dept. of Education, San Juan

Lena M. Schermann, M.A., Bureau of Public Health Nursing, State Dept. of Health, Lansing, Mich., Regional Consultant

Dental Health Section

C. J. Hollister, D.D.S., 217 State St., Harrisburg, Pa., Exec. Secy., State Dental Society

Unaffiliated

Gisli Asmundson, 4645 Mississippi St., San Diego, Calif., Pharmacist, U. S. Navy

George H. Bradley, 605 Volunteer Bldg., Atlanta, Ga., Senior Entomologist (R), U. S. Public Health Service

Conchita Carrasquillo, Box 452, Caguas, P. R., Medical Social Work Supervisor, Bureau of Social Services, Dept. of Health

Gumersindo Cordero-Antunano, Ave. Guzman, Box 275, Humacao, P. R., Official Trainee, Insular Dept. of Health

John J. Essex, D.V.M., 831 Mercantile Bank Bldg., Dallas, Tex., Typhus Control Consultant and Sanitarian (R), U. S. Public Health Service

Paul J. Friedman, D.V.M., 242 Lexington Ave., Passaic, N. J., Veterinarian

Richard C. Gary, P. O. Box 1243, Pensacola, Fla., Pharmacist, U. S. Navy

Isabel Gordo, M.A., Medical Social Work Dept., District Hospital, Fajardo, P. R., Supervisor

Harold J. Haley, 59 Grove, Leicester, Mass., Pharmacist, U. S. Navy

Jack F. Hensley, 316 Dixie Ann Ave., North Sacramento, Calif., Case Finding Director, Sacramento Tuberculosis Assn.

Ann L. McColley, 3333 Grand Ave., Des Moines, Ia., Physical Therapist, Iowa Lutheran Hospital

Samuel Morris, Ph.D., 41 Exchange Place, U. S. Public Health Service, Atlanta, Ga., Protozoölogist in charge of Typhus Control for Puerto Rico and the Virgin Islands

Virgilio Negron, Monsenor Torres 1, Rio Piedras, P. R., Chief Health Inspector, Bureau of Public Health Unit

Jose L. Pillich-Bachillie, 71–11th St., Santurce, P. R., Health Official (Trainee), Puerto Rican Health Dept.

Rafael Pirazzi-Rexach, 54 Manila St., P. O. Box 396, Rio Piedras, P. R., Public Health Official (Trainee), Insular Dept. of Health

John J. Smith, 115 11th Ave., N.E., Minot, N. D., Pharmacist, U. S. Navy

Dennis F. Williamson, P. O. Box 532, St. Pauls, N. C., Sanitation Officer, U. S. Navy

DECEASED MEMBERS

George E. Bolling, Brockton, Mass., Elected Member 1900, Charter Fellow, and 40 year member, Laboratory Section

Ben W. Creel, D.V.M., Mobile, Ala., Elected Member 1940, Unaffiliated

Benjamin E. Holsendorf, Phar.D., St. George, Staten Island, N. Y., Elected Member 1944, Public Health Education Section

Lt. Peter J. Knaus, Sn.C., Service Overseas, Elected Member 1943, Laboratory Section

Frederick B. Miner, M.D., Flint, Mich., Elected Member 1940, Maternal and Child Health Section

Barbara S. Quin, New York, N. Y., Elected Member 1929, Unaffiliated

Randle C. Rosenberger, M.D., Philadelphia, Pa., Elected Member 1915, Charter Fellow, Laboratory Section

DR. PALMER COMMISSIONED

George T. Palmer, Dr.P.H., Associate Field Director of the A.P.H.A., has been commissioned as Senior Sanitarian (Reserve) in the U. S. Public Health Service with the rank of Lt. Col., and assigned to the Division of Public Health Methods to be in charge of a unit on Professional Education. He will serve as Executive Secretary for the Surgeon General's Committee on Post-War Training of Public Health Personnel. By the latter part of July, he will probably be located permanently in Washington, D. C.

A.P.H.A. TO ACCREDIT SCHOOLS OF PUBLIC HEALTH

The Association's Committee on Professional Education, William P. Shepard, M.D., Chairman, with the approval of the Executive Board, is undertaking the accreditation of schools of public health. The initiative for this urgent project came originally from the Association of Schools of Public Health, in a resolution adopted on April 23, recommending that the A.P.H.A. "create a properly constituted accrediting body to carry forward progressively a list of universities qualified with regard to program, personnel, and facilities, to offer adequate courses leading to the degrees of Master of Public Health, Doctor of Public Health, and the Diploma in Public Health." This was followed closely by a similar request to the Association from the Surgeon General's Committee on Postwar Training. Funds have been made available by the Commonwealth Fund as of June 15 for a period of three years. A highly qualified counsellor will be responsible for the investigative work, and he will be aided by persons experienced in the administration of health departments, chosen from different localities for different schools.

An Advisory Committee of the Association of Schools of Public Health, under the Chairmanship of Harry S. Mustard, M.D., will work with the Committee on Professional Education.

The suggested procedure, subject to possible modification, contemplates that schools will be examined for accreditation at their own request, and that first attention will be given to schools in the United States now offering the M.P.H. and in Canada offering the Diploma. The development of criteria is already under way.

Accreditation of field training stations and of courses for various public health specialties will not be attempted immediately. Schools of sanitary or public health engineering will presumably continue to be accredited by the professional engineering group recently active in this field and the National Organization for Public Health Nursing will continue in the field of public health nursing programs of study.

The preliminary plans include early announcement that the Association is prepared to undertake accreditation of schools of public health, and publication of a list of accredited schools as soon as possible.

WANTED: BACK ISSUES OF THE AMERICAN JOURNAL OF PUBLIC HEALTH

Again the Central Office is sending out an SOS for *Journals* that are out of stock and which are especially needed now to complete sets for the countries that have been occupied and which now are requesting help in rebuilding their technical libraries. The *Journals* that can be used for this purpose are listed below:

1941—January, April, July, August
1942—January, March
1943—January, March, August, September, October, November, December
1944—June, August
1945—January, February, March, April

Members who can return any of the above *Journals* to the A.P.H.A. are requested to do so collect.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

Positions Available

(Supplemental to lists in recent Journals)

Wanted: Two engineers for Industrial Hygiene Service of Tennessee. Four different starting salaries between $2,364 and $3,900 depending on training and experience. Car furnished. Positions permanent. Opportunity for advancement. Apply Dr. R. H. Hutchinson, Commissioner of Health, Nashville 3, Tenn.

Wanted: Physician, Division of Child Hygiene, Ohio Dept. of Health. Salary $4,200. Must be graduate of approved medical school, have 1 year's internship and at least 1 year graduate training, plus 1 year of training or experience in clinical pediatrics or obstetrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Dept. of Health, State Departments Bldg., Columbus 15, Ohio.

Positions open: District and County Health Officers in Florida. Medical degree required. Write or wire Merit System Supervisor, State Board of Health, Gainesville, Fla., for complete information.

Physician wanted: Public health pediatrics and epidemiology in large California County Health Department. Major duties consist of infant and preschool health conferences, school examinations, and epidemiology. Beginning salary $455 per month, plus travel allowance, and one meal a day. California license required. Training, experience in pediatrics or public health desirable. Immediately available. Apply William C. Buss, M.D., Kern Co. Health Dept., Bakersfield, Calif.

Bureau of Tuberculosis, Board of Health, Territory of Hawaii, seeks Biometrician or Statistician. Position will probably be classified under Territorial Civil Service as CAF-8 with salary of $244.59 plus wartime bonus of $50 and yearly increment of about $192 up to 5 years. Bureau of Tuberculosis is also looking for young physician experienced in tuberculosis work to have immediate charge of active case finding survey program now under way. This position classified under Territorial Civil Service as P-5 with salary of $416.67 plus $50 wartime bonus and yearly increment of about $250 up to 5 years. Apply Robert H. Marks, M.D., Director, Bureau of Tuberculosis, Territorial Board of Health, Honolulu, T.H.

Wanted: Bacteriologist with B.S. or M.S. degree, preferably male, to teach student nurses, 45 hour course twice a year, to assist with teaching of second year medical students and do general laboratory work. Salary $2,000 with option of complete maintenance for $25 per month. Apply Dr. R. J. Schenken, Director, Dept. of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans 13, La.

Wanted: Physician to assume directorship, Bureau of Venereal Diseases, in eastern city of 185,000 population. Permanent position. Minimum salary $4,657, maximum $5,197.37, includes cost of living adjustment. Travel allowance. Apply **Box J**, Employment Service, A.P.H.A.

Wanted: City Health Services director for city health department in California, city of 100,000 population. Pediatrician or public health trained physician to administer program, serve as clinician in child health conferences and supervise nursery school health program. Salary up to $6,300 per annum, plus travel. Send complete details and photograph to **Box I**, Employment Service, A.P.H.A.

Excellent opportunities, permanent tenure, for doctors, dentists, nurses, technicians with the Oregon State Board of Health in specialized fields. For information write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

Wanted: Immediately: Veterinarian for Columbia County Department of Health. Salary—maximum $3,600 per year plus automobile and up-keep. Veterinarian must be licensed in New York State. Address Dr. Sue H. Thompson, 612 Warren Street, Hudson, N. Y. Position for the duration of the war.

Wanted: Sanitarian and dairy inspector for field work. Salary $2,400 per year plus $5 per day for living expenses. Auto with gasoline and all other expenses furnished. Apply E. J. Ward, Commissioner of Agriculture, State Dept. of Agriculture, Cheyenne, Wyoming.

Wanted: Public health officer in well established health department in county of 68,000 population. Salary $5,500. Apply Floyd O. Prunty, Chairman, Marion Co. Lay Health Committee, 300 Second St., Fairmont, W. Va.

Executive Secretary Wanted. Applicant must have some specialized training and experience in health education. Executive experience desirable. Salary $3,000 up, depending upon qualifications. Car furnished. Apply with full information to A. C. Martin, M.D., Nassau Co. Cancer Committee, 1551 Franklin Ave., Mineola, N. Y.

Wanted: Experienced graduate bacteriologist. Take complete charge of local health department laboratory. Civil service protection, tenure and pension. Starting salary $1,980 per annum. Apply Health Department, P. O. Box 786, Plainfield, N. J.

Wanted: A man well trained in bacteriology, Ph.D. preferred, with considerable chemical training; experience in field of surface-active agents, detergents, and foods desirable. Apply Frozen Food Foundation, Inc., P. O. Box 1332, Syracuse, N. Y.

City of Jackson, Mich., Civil Service Board will accept immediate applications for position of public health nurse in city health department. Must be graduate of high school and school of nursing of recognized standing with special training in public health nursing; registration in Michigan; some experience in public health nursing, preferably with certificate in public health nursing and some knowledge of advanced public health and social service practice. Salary $2,000 per year. Applications may be obtained from Civil Service Board, 4th Floor, City Hall, Jackson, Mich.

Wanted: General duty nurses, 48 hour week, $125, full maintenance; also, anesthetist, 48 hour week, $200, full maintenance. Apply T. J. Samson Community Hospital, Galsgow, Ky., Attention Director of Nurses.

Wanted: Public Health Nurses, Knoxville Area. Generalized nursing service in new and growing health department with unusual opportunities. Starting salary $2,500 per year or higher, depending on qualifications. Opportunity for advancement. Apply Health Officer, Oak Ridge Dept. of Health, P. O. Box 486, Oak Ridge, Tenn.

Wanted: Experienced sanitarian for state dairy and restaurant inspection. Salary $2,400 a year, plus $5 per day expenses. Car furnished with gasoline and other expenses paid. Apply Dr. G. M. Anderson, State Board of Health, Capitol Building, Cheyenne, Wyo.

Two positions open in Sanitation Section, Div. of Health, City of St. Louis: Public Health Engineer II, salary $210 to $285 per month. Work consists of making surveys and studies of industrial plants, to determine nature and magnitude of industrial hygiene problems; making quantitative studies of plant environment, etc., checking protective equipment for effectiveness and make recommendations for further control measures. Study of ventilation, illumination, and sanitation of workroom. Desirable qualifications include graduation from recognized school of engineering and some experience or graduate training in industrial hygiene or public health engineering. Public Health Engineer I, salary range $170 to $220 per month. Engineering investigation of environmental problems and conditions, etc. Desirable qualifications include graduation from recognized school of engineering. No experience necessary. Applications may be made to Personnel Dept., Room 235, Municipal Courts Bldg., St. Louis 3, Mo.

POSITIONS WANTED

Health educator, Ph.D., Harvard, with training in medical science, public health and education, experienced as teacher, seeks position in Northeastern United States. **H-512**

Health educator, Master of Science in Public Health Education, with experience in visual aids, would like position with private agency in Southwest or Central West. **H-514**

[END OF A.P.H.A. LISTING]

Opportunities Available

Advertisement

WANTED—(a) Public health director; city-county program serving population of over half million; policies pertaining to departments controlled by university; teaching and research opportunities; $7,500. (b) Physician to engage in public health, pediatrics, and epidemiology; major duties consist of infant and preschool health conferences, school examinations and epidemiology; county health department; headquarters in town of 80,000 located approximately midway between Los Angeles and San Francisco. (c) Woman physician to join staff of student health service; 4,000-4,500 students; one-third are women students; duties confined entirely to their care; South. (d) Public health physician to direct department of health, public school system; enrollment of 25,000; 800 employees; well staffed department; Middle West. (e) Physician for men's division of university health service and, also, two women physicians for women's division; Middle West. (f) Pediatric and obstetric consultants, state department of health; if not trained in public health, department will provide training; women eligible. **PHS-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Field director; state-wide health program; should be particularly well qualified public relations; Middle West. (b) Senior bacteriologist; duties consist of directing branch laboratory, performing difficult bacteriological, parasitological, and serological laboratory examinations; state department of health; Southwest. (c) Health educator; private agency; Chicago area. (d) Bacteriologist; public health laboratories; $3,000, meals, Michigan. (e) Technologist trained in public health laboratory methods; state public health laboratories; town of 30,000; Rocky Mountain area. (f) Health director; state tuberculosis association; Middle West. (g) Assistant professor, department of bacteriology and public health, state college; Pacific Coast. **PHS-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Public health nurse to direct program; duties consist of complete charge of various activities including home nursing, nurses aide and nurse recruitment; large city; southern California. (b) Assistant supervisor of nurses and, also, several staff nurses; public health organization, inaugurated two years ago; generalized program; growing organization; excellent opportunity for advancement; South. (c) Supervising nurse; county health department, well equipped department, staff of 12, progressive program having support of entire community; town of 30,000; Southeast. (d) Several public health nurses; Central and South America. (e) Orthopedic public health nurse; in addition to training in public health nursing, should have completed course in orthopedic nursing or physical therapy; $3,240 including liberal travel allowance; Middle West. (f) Public health nurse to direct clinic, member of Community Chest and operated by private hospital; approximately 100 patients daily, cancer clinic in connection; California. (g) Several staff nurses for city-county department of health; generalized program; will consider registered nurses without training; salary during period of training $150; salary for those trained or experienced in public health dependent upon qualifications but ranging from $170 to $220; town of 20,000, Pacific Northwest. (h) Public health nurse to give supervisory and consultant nursing services in the various specialties; state department of health; salaries dependent upon qualifications, minimum $3,000. **PHS-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

Situations Wanted

Advertisement

Public health nurse is available for executive position; B.S. degree Columbia; three years, supervising nurse, state department of health; five years, field supervisor, large industrial company; four years, educational director, public health department, college of nursing. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist, graduate of the dental department of one of the leading universities, is available; twelve years' successful private practice, during which time he has held important faculty appointment; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; A.B., M.S., Ph.D. degrees; eight years' teaching experience; six years, director, department health education, large industrial company; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; bachelor of arts degree, Eastern college; medical degree, Middle Western medical school; Master's degree in Public Health, Johns Hopkins; twelve years' experience as professor of preventive medicine, public health and industrial medicine, university medical school; has made valuable contributions to medical literature; recognized as a leader in field of industrial hygiene; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Malariologist; B.S. in Biology; M.S. in Protozoölogy; Ph.D. in Bacteriology and Parasitology; two years, instructor and professor of biology, small college; while engaged in graduate work served as assistant in department of bacteriology and parasitology; expects early discharge from Army after three years with Sanitary Corps where work has been principally in malaria survey and control; has distinguished himself in the field of research. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

NEWS FROM THE FIELD

RED CROSS POLICY COVERING CIVILIAN BLOOD DONOR SERVICES

G. Foard McGinnes, M.D., National Medical Director, American Red Cross, Washington, D. C., has released a statement of a new policy of the Red Cross regarding participation in civilian blood donor programs. Medical and health agencies which now have or are planning a program to furnish blood and blood derivatives for civilian use and are interested in obtaining the assistance of the Red Cross chapters should make contact with their chapter, if the territory the program is to serve is within an individual chapter's jurisdiction, or the appropriate area office of the American National Red Cross if the program is to serve a territory involving the jurisdiction of more than one chapter.

Authorization will be granted to Red Cross chapters to participate in civilian blood donor services only in case the chapter and the sponsoring agency meet the terms and conditions stipulated by the American National Red Cross. This requirement is in the interest of giving to the civilian population the benefit of the intensive experience gained by the American National Red Cross and the agencies associated with it in the operation of its blood donor service for the armed forces. It will also encourage the establishment, on a nation-wide basis, of proper standards of donor procurement and enrollment and of blood procurement and processing. The continuance of the American Red Cross in the field of blood donor service should inspire public confidence and stimulate a more ready response on the part of volunteer blood donors. This should facilitate the widest possible distribution of the products of blood donor services to those who need them.

NATIONAL ADVISORY CANCER COUNCIL RELEASE

Nine grants-in-aid totaling $79,377 were approved at the twenty-eighth meeting of the National Advisory Cancer Council held in June at the National Cancer Institute of the U. S. Public Health Service, Bethesda, Md.

These funds, the greatest amount ever granted at one time by the Council, reflect the growing interest in the disease by medical groups throughout the country who are joining hands in cancer research and education. At the present time cancer is the second cause of death in the nation.

The largest individual grant, $24,500, was made to Harvard University, Boston, Mass., for the study of the relation of steroid hormones to growth and tumors. Dr. J. H. Means will be in charge of this work. Drs. Fuller Albright and Joseph C. Aub will also participate in these studies.

Mt. Sinai Hospital, New York, was next on the list of approved grantees with a request of $10,775 for clinical studies on gastric cancer. This work will be under the direction of Dr. Franklin Hollander.

Harvard University was given an additional grant of $10,000 for study of the pathology of cancer of the stomach, peptic ulcer, and gastritis, with Dr. Shields Warren in charge.

Another grant was voted for clinical studies of gastric cancer which will be conducted by Dr. Leon Schiff of the University of Cincinnati, Cincinnati, Ohio. The school was granted $10,000 for this purpose.

Approval was also given to North-

western University's, Chicago, request for $8,500 for research in cancer education. Dr. A. C. Ivy, member of the Council, will supervise the work.

Dr. Paul A. Zahl will direct research on the virus-like agent in mammary cancer of mice for which the Haskins Laboratories, New York, was granted $5,000.

The relation of certain types of diets to induced cancer in rats is the research planned by the Detroit Institute of Cancer Research, Detroit, Mich. A grant of $6,152 was recommended for the study. Dr. W. F. Dunning will be in charge.

New York University, New York, was granted $3,500 which will be used by Dr. Robert W. Chambers in a study of Hodgkin's disease.

A grant of $1,450 was made to the University of Minnesota, Minneapolis, Minn., where studies on leukemia in mice will be conducted by Dr. Arthur Kirschbaum.

Members of the Council are:

Dr. George M. Smith, Executive Director of Council, and Professor of Anatomy of Yale University, New Haven, Conn.
Dr. Frank E. Adair, President of the American Cancer Society, Inc., and a staff member of Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York
Dr. A. C. Ivy, Professor of Physiology, Northwestern University Medical School
Dr. James B. Murphy, Rockefeller Institute for Medical Research, New York
Dr. A. Baird Hastings, Harvard University Medical School, Boston, Mass.
Dr. Sherwood Moore, Director of the Mallinckrodt Institute of Radiology, St. Louis, Mo.
Surgeon General Parran, Chairman, *ex officio* of the Council

The Public Health Service was represented by Dr. R. E. Dyer, Director of the National Institute of Health, Dr. R. R. Spencer, Director of the National Cancer Institute and Dr. Ralph Braund, Director of the Tumor Clinic, U. S. Marine Hospital, Baltimore, Md.

FOOD INFECTION OUTBREAK DUE TO CHEESE

About March 26, a number of residents of St. Francisville, Ill., became ill with symptoms of diarrhea, nausea, vomiting and fever. The cases rapidly increased in number until about 100 individuals were known to be affected.

Lawrence County, where St. Francisville is located, had been the first county in Illinois to take advantage of the Searcy-Clabaugh Act permitting the establishment of county health departments, and as a result had the services of specially trained public health personnel available to control situations such as had developed. With the cooperation of the attending physician, Dr. L. W. Frame, Health Officer of Lawrence County, immediately began an investigation which soon revealed that practically all of the persons involved in the outbreak had eaten long horn cheese which had been purchased from two local stores. In families where not all members had eaten of the cheese, it was noted that only those who had done so became ill.

The cheese from both stores was found to have been of the same lot and to have been obtained from the same distributor in a nearby town in Indiana. The further sale of the suspected cheese was stopped and the State Department of Public Health was notified. With the assistance and coöperation of the distributor the epidemiologic trail was pursued and the cheese was traced back to East St. Louis and then to a cheese manufacturing plant in northern Illinois. Shipments of this particular lot of cheese had been made to various places and it was soon learned that an outbreak similar to the one in St. Francisville had occurred in Dyersberg, Tenn., and the same cheese was suspected of being the cause. All of the cheese that could be located was withdrawn from the market by the distributor. Bacteriological studies are

being made in an attempt to learn exactly what organism was responsible for this outbreak.

An inspection of the creamery revealed the contaminated cheese had been made only 3 days prior to being shipped to the distributor, and only two weeks before consumption in St. Francisville. Of greater public health significance was the fact that, although the milk used had been put through a heating process, sanitary conditions in the plant were such that ample opportunity existed for contamination of the finished product. To prevent further outbreaks of this kind, the strictest possible sanitary practices are necessary in food handling establishments and no food handler should be permitted to work while suffering from any form of gastrointestinal disease.

COLONEL GOTAAS GETS CHILEAN ORDER OF MERIT

Colonel Harold B. Gotaas, Sn.C., Director of the Division of Health and Sanitation, Institute of Inter-American Affairs, Washington, has been decorated by the Chilean Government with the Order of Merit. Before joining the Army in 1942, Colonel Gotaas was Professor of Sanitary Engineering at the School of Public Health, University of North Carolina, Chapel Hill.

MARY PEMBERTON NOURSE FELLOWSHIP IN PUBLIC HEALTH AWARDED

Vassar College, Poughkeepsie, N. Y., has announced the award of the Mary Pemberton Nourse Fellowship in Public Health, which is offered every four years, to Mrs. Donald E. Kent, at present health consultant in the public schools of Winston-Salem, N. C. Mrs. Kent is a graduate of Agnes Scott College in 1933 and received an A.M. degree at Emory University in 1934. She has been health education coordinator in Anderson County, Tenn., and has worked on the malaria control program in more areas of the U. S. Public Health Service. She will use the Fellowship for further study at the University of North Carolina in the evaluation of methods and materials for health education.

HAWAII PUBLIC HEALTH ASSOCIATION ORGANIZED

An organization meeting of the Public Health Society of the Territory of Hawaii was held on April 24. A Constitution and By-Laws, patterned after that of the American Public Health Association and affiliated societies, was adopted and officers were elected as follows:

President: Kaarlo W. Nasi, P.A. Sanitary Engineer, USPHS

Vice-President: Theodore Rhea, Director, Palama Settlement

Secretary: Elmer Anderson, Director of Public Health Education, Board of Health

Treasurer: Myrtle Payne, R.N., Castle and Cooke, Ltd.

Members of Executive Committee at Large: Dr. C. L. Wilbar, President, Board of Health; Dr. Raymond Nebelung, Ex. Director Health Committee, Honolulu Chamber of Commerce; Dr. Joseph A'icata, University of Hawaii

Efforts are under way by the newly organized Association to promote membership in the American Public Health Association.

DR. KAMAL OF EGYPT DELEGATE AT UNCIO

Among the delegates at the United Nations Conference, San Francisco, recently closed, was Dr. Ahmed M. Kamal, the Director General of the Department of Preventive Medicine in the Egyptian Ministry of Health. Dr. Kamal is also President of the Egyptian Public Health Association with offices in Cairo.

During his stay in the United States Dr. Kamal has visited a number of health departments including those in California, the Tennessee Valley Au-

thority, New York City, Chicago, and Boston. The Egyptian Public Health Association was founded in 1926 and is an inclusive type of professional society representative not only of the medical officers of health but of other specialties and includes Fellows, members, and associates. The official publication is the *Journal of the Egyptian Public Health Association,* which is published largely in Arabic. Dr. Kamal visited the offices of the American Public Health Association and the National Health Council on June 26.

DR. PAULA SOUZA OF BRAZIL DELEGATE TO UNCIO

Dr. G. H. de Paula Souza, formerly Director of the School of Hygiene, Sao Paulo, Brazil, and presently Chief of the Epidemic Disease Section of UNRRA in Washington, has been made a member of the Brazilian delegation to the United Nations Conference in San Francisco. Dr. Paula Souza, who is a graduate in public health from Johns Hopkins University School of Hygiene and Public Health, Baltimore, in 1920, has served as Vice President of the A.P.H.A.

HEALTH CENTERS AND SCHOOLS AS WAR MEMORIALS

The Society of State Directors of Health and Physical Education, of which Frank S. Stafford of the U. S. Office of Education, Washington, is President, has directed attention to the desirability of including schools as one of the major types of living war memorials through the construction of new buildings and the addition of memorial swimming pools, athletic fields, gymnasiums and playgrounds to existing schools.

With the increasing emphasis on functional memorials, health workers will wish to take advantage of opportunities of emphasizing public schools as well as health centers as a type par excellence of such functional war memorials of use to all the people.

NATIONAL TUBERCULOSIS ASSOCIATION ELECTS NEW OFFICERS

At the June meeting of the Executive Committee of the National Tuberculosis Association held in New York, N. Y., the following officers were elected for the succeeding year.

President: Will Ross, Wisconsin
President-elect: Dr. Victor F. Cullen, Maryland
1st Vice-President: Dr. H. Stuart Willis, Michigan
2nd Vice-President: Dr. Philip H. Pierson, California
Honorary Vice-Presidents: Hon. Harry S. Truman, Washington, D. C.; Surgeon General Thomas Parran, Washington, D. C.
Secretary: Dr. Charles J. Hatfield, Pennsylvania
Treasurer: Livingston Platt, New York, N. Y.

CUBAN DOCTORS RECRUITED BY UNRRA FOR SERVICE IN EUROPE

The United Nations Relief and Rehabilitation Administration announces the arrival in Washington of 9 Cuban doctors enroute to work on the program of medical and health assistance which UNRRA is carrying on in the liberated areas of Europe. This is the first group of physicians recruited in Latin America for such service. They are:

Bernardo Antonio Santamarina Hernandez
Rodrigo A. Bustamente Mercayda
Rene Cirilo Vallejo Ortiz
Oscar Ferrer Cros
Enrique Roig Fernandez
Amaury Sabino Escalona Almeida
Lidio Onelio Mora Morales
Regino Rodriguez
Antonio Saniz de la Pena y Nodarse

INDIANA STATE COUNCIL FOR MENTAL HEALTH

Governor Ralph E. Gates recently appointed five members to the Indiana Council for Mental Health, a group

set up under 1945 legislation to develop the construction of a mental hospital and clinic on the campus of the Indiana University Medical Center in Indianapolis. Members of the Council are Dr. LaRue D. Carter, Professor of Neurology; Dr. Thurman B. Rice, Chairman of the Department of Bacteriology and Public Health and Acting Secretary of the State Board of Health, ex officio; Dr. Norman M. Beatty, Indianapolis; Judge John H. Morris, New Castle, and Otto Walls, Director of the State Department of Public Welfare, ex officio.

The 1945 general assembly appropriated $250,000 for the project and earmarked an additional $75,000 if needed. The hospital will be made available for instruction of medical students, student nurses, interns and resident physicians under the supervision of the medical school faculty. The council will have the authority to transfer psychiatric patients in state hospitals from one institution to another or to the so-called screening hospital on the Indiana University Medical Center Campus, admission to which will be open to voluntary applications on recommendation of attending physicians.

DR. STAFFORD M. WHEELER KILLED IN ACTION

Stafford M. Wheeler, M.D., Senior Lieutenant, U. S. Naval Medical Corps, was killed by the explosion of a land mine while on duty with the U. S. Typhus Commission near Zerica, Yugoslavia, on April 13, 1945.

Dr. Wheeler was a graduate of the Harvard Medical School and under appointment as Associate Professor of Epidemiology at the DeLamar Institute of Public Health, Columbia University, New York. He was a Fellow of the Epidemiology Section, A.P.H.A. Entering the Naval Service in June, 1942, he was stationed for two years at the Naval Medical Center in Bethesda, Md., where he taught epidemiology. After a tour of submarine duty he went in November of 1944 to work with the Typhus Commission under Brigadier General Leon A. Fox. He had been assigned to work with a Partisan Army unit in Bosnia and Herzegovina. The fatal accident occurred near Sarajevo. He is survived by his wife, Anne B. Wheeler, and two children who live in Bethesda, Md.

LT. COL. RALPH S. MUCKENFUSS, M.C., AWARDED LEGION OF MERIT

Lieutenant Colonel Ralph S. Muckenfuss, Medical Corps, Army of the United States, has been awarded the Legion of Merit for exceptional and meritorious conduct in the performance of outstanding services as Commanding Officer of the First Medical General Laboratory from June 28, 1943, to January 19, 1945. The citation signalizes Colonel Muckenfuss's initiative and energy in setting up the First Medical General Laboratory in the United Kingdom. Under his supervision, the only blood bank in the United Kingdom was organized. As United Kingdom Consultant in Research he did much to further the scientific background of medical practice in the European Theatre of operations. Dr. Muckenfuss entered the military service from his post as Director of Laboratories of the New York City Health Department.

STATUS OF MICHIGAN HOSPITAL COMMISSION CHANGED

The State Hospital Commission will be known as the Department of Mental Health, in accordance with a recently enacted law which becomes effective September 7. The act further sets up a five member, policy determining commission by appointment of the Governor to make policies and adopt rules and regulations governing the operation of the department. The department is to be housed in suitable offices in

Lansing. With the creation of the new Department of Mental Health, the old State Hospital Commission will be abolished.

U. S. CADET NURSE CORPS RECRUITMENT

During the last 12 months, 61,471 new student nurses have enrolled in Schools of Nursing, Surgeon General Thomas Parran of the Public Health Service, Federal Security Agency, who administers the U. S. Cadet Nurse Corps, announced. This is the second consecutive year the corps has exceeded its recruitment quota.

The quota for the fiscal year ending June 30 was 60,000, he said. For the last six months of 1945 the annual quota will be the same as last year's. Military and civilian nursing needs will be reviewed by the Public Health Service late in the year to determine whether any change in the student nurse quota is indicated in relation to the course of the war.

STATE HEALTH DEPARTMENT ACTIVITIES IN WEST VIRGINIA

The Public Health Council has entered an order separating the Bureau of Industrial Hygiene from the Division of Sanitary Engineering. Similar action has separated the Bureau of Dental Hygiene of the State Health Department from the Division of Maternal and Child Hygiene, setting it up as a separate unit. The new Dental Bureau will be under the direct supervision of Dr. John E. Offner, Weston, State Health Commissioner; two dental counselors will carry out the work now done by a dental consultant.

ALLIED HEALTH COUNCIL ORGANIZED IN ALABAMA

The Allied Health Council of Alabama was recently organized to coördinate the activities of various health groups and to conduct an educational campaign to increase interest in the state's public health work. C. B. Bray, President of the Alabama Dental Association, and Mrs. Thelma M. Coburn, Executive Secretary of the Alabama Pharmaceutical Association, were named President and Secretary-Treasurer respectively. The Executive Board consists of B. F. Sapienza, representing the Alabama Dental Association, Mrs. Walter Bragg Smith, representing the State Nurses' Association, Elbert W. Gibbs, representing the Alabama Pharmaceutical Association, and Dr. Burton F. Austin, Montgomery, State Health Officer, representing the State Health Department.

TRAINING OF HOSPITAL ADMINISTRATORS

The W. K. Kellogg Foundation has made an initial grant of $30,000 to carry on the first year's work of a three year educational project of a Joint Commission on Education of the American College of Hospital Administrators and the American Hospital Association. In the words of the President of the college, Dr. Claude W. Munger, the function of the Joint Commission is to establish "hospital administration as a bona fide profession, in the promulgation of sound educational measures for pre-service training, and in still further development and improvement of in-service education." Charles H. Prall, Ph.D., who had just completed five years with the American Council on Education, began work as director of the Joint Commission on January 1, 1945.

MRS. BURKE RECEIVES 1945 BORDEN AWARD

The American Home Economics Association has announced that Mrs. Bertha Shapley Burke, associate in nutrition at the Harvard University School of Public Health, Boston, has received the 1945 Borden Award for outstanding achievement in research in applied nutrition. The gold medal and

the award of $1,000 were given to Mrs. Burke for her studies on diets of pregnant mothers and the effect of these diets on their babies. Mrs. Burke is a native of Massachusetts and a graduate of Vassar College and Columbia University who has been associated with the Child Development Laboratory at Harvard since 1932.

COLORADO INDUSTRIAL HYGIENE ABSTRACTS AVAILABLE

Fred R. Ingram, Chief of the Division of Industrial Hygiene at the University of Colorado School of Medicine, Denver, has made available abstracts of the papers presented at the Industrial Hygiene Section of the Colorado Public Health Association conference held in Denver May 24 and 25 on the subject of Industrial Hygiene and Safety in Colorado. Contributors cover the subjects "Role of the Plant Physician," "Role of the Industrial Nurse," "Role of the Plant Industrial Hygiene and Safety Engineer," "Role of the Colorado Industrial Commission," and "Role of the Colorado Division of Public Health."

PERSONALS

Central States

MATTIE J. BULLARD, M.D.,† who has been Acting Director of the Medical Inspection Dept., Gary Public Schools, Gary, Ind., has been commissioned in the U. S. Public Health Service Reserve for service with UNRRA overseas.

D. H. SWENGEL, M.D., recently resigned as Health Officer of the Cass County (Mich.) Health Unit to accept a similar position with the Mecosta-Osceola District health unit.

FRED W. TANNER, PH.D.,* Head of the Department of Bacteriology of the University of Illinois, has been elected President of the Institute of Food Technologists.

RALPH TEN HAVE, M.D.,† of Grand Haven, Mich., Health Officer of Ottawa County, has resigned to enter private practice.

Eastern States

LOUIS I. DUBLIN, PH.D.,* Second Vice-President and Statistician of the Metropolitan Life Insurance Company, has completed his assignment as full-time assistant to BASIL O'CONNOR,† Chairman of the American Red Cross, and as Chairman of the organization's Administrative Committee, and has resumed his duties with the Insurance Company.

W. GEORGE GOULD,† Assistant Director, Division of Legal and Protective Services, American Social Hygiene Association, is now a Lieutenant (jg) in the U. S. Naval Reserve and is on active duty assisting with the Venereal Disease Program.

IVAN C. HALL, PH.D.,* has resigned as Professor of Bacteriology and Director of the Department of Bacteriology at the New York College of Medicine, Flower and Fifth Avenue Hospitals, in New York City.

ANNE M. HARTLEY, R.N., retired from her position with the Pennsylvania State Department of Health on June 1. She has been a member of the staff of the State Department of Health since 1909 and has served under each of the commissioners and secretaries which the Department has had.

MISS LUCILE PETRY, Director of the Division of Nurse Education, U. S. Public Health Service, Bethesda, Md., recently received the degree of Doctor of Humane Letters from Adelphi College, Garden City, N. Y., and the degree of Doctor of Laws from the University of Syracuse, Syracuse, N. Y. Miss Petry is a

* Fellow A.P.H.A.
† Member A.P.H.A.

graduate of the University of Delaware, of Teachers College, Columbia University, and of the Johns Hopkins Hospital School of Nursing. In 1943 she became the first woman director of a division of the U. S. Public Health Service and leader of the largest uniformed women's organization in the nation, the U. S. Cadet Nurse Corps.

MAJOR ISRAEL WEINSTEIN, M.C.,* was awarded the Purple Heart as a result of having been wounded April 25, 1945, near Regensberg, Germany, during very heavy fighting. Major Weinstein is Division Medical Inspector and Assistant Surgeon of an infantry division. Since August, 1942, he has been on military leave from the New York City Health Department, where he is Assistant Director of the Bureau of Health Education. The Major was awarded a Purple Heart in World War I when he was a Lieutenant in the Sanitary Corps. At present, he is with his division in Germany.

Southern States

ERNEST W. GOODPASTURE, M.D., Professor of Pathology at Vanderbilt University School of Medicine and recipient of the Sedgwick Memorial Medal from the American Public Health Association in 1944, has been appointed Dean of the Vanderbilt University School of Medicine succeeding W. S. LEATHERS, M.D.,* past President of the American Public Health Association, who has retired.

CHARLES REAGAN from the U. S. Public Health Service, was appointed as Sanitarian in Kanawha County, W. Va., succeeding JOSEPH L. DERMODY who resigned recently to accept a post with the U. S. Public Health Service at Washington.

MARGUERITTE STILLMAN of Morgantown, W. Va., was appointed, June 7, as Field Representative for the Division of Vital Statistics. Miss Stillman will visit registrars, physicians, midwives, etc., throughout the state in an effort to bring West Virginia's birth registration up to at least the 90 per cent minimum required by the Bureau of the Census.

CHANGES IN HEALTH OFFICERS IN WEST VIRGINIA

JAMES A. DOLCE, M.D.,† Fairmont, has resigned as Health Officer of Marion County, effective April 23.

CLAUDE A. THOMAS, M.D., who has been serving as Health Officer of District Number 4, comprising the Counties of Lewis, Calhoun, Gilmer, and Upshur, during the absence because of illness of DR. WALTER J. RILEY,† Weston, has been transferred to Romney, where he will be in charge of District Number 5, including the Counties of Hardy, Grant, Hampshire, Mineral, and Morgan. Dr. Riley has returned to his activities in District Number 4.

COL. WILLIAM L. WILSON, of Dallas, Tex., and Washington, D. C., Deputy Director of SHAEF's Public Health Branch, has been awarded the U. S. Typhus Commission's Medal for "exceptionally meritorious service which materially assisted in reducing the incidence of typhus in northwestern Europe." Col. Wilson was assigned to develop plans for control of the disease in that area, particularly among refugees and displaced persons.

C.-E. A. WINSLOW, DR.P.H.,* COLONEL IRA V. HISCOCK,* and DR. CLAUDE W. MUNGER † have been named as Board of Surveyors charged with the direction of the coming health and hospital survey sponsored by the Washington Metropolitan Health Council, a Division of the Council of

* Fellow A.P.H.A.
† Member A.P.H.A.

Social Agencies, for the Washington Metropolitan Area.

Western States

JOHN A. CARSWELL, M.D., of Santa Barbara, Calif., has resigned as Health Officer of Santa Barbara County.

IRA O. CHURCH, M.D.,* has been appointed County Health Officer of Santa Barbara County, Santa Barbara, Calif., succeeding JOHN A. CARSWELL, M.D.,† who has resigned to become Medical Director of the Grand View Hospital, Ironwood, Mich. Dr. Church has recently spent three years as Director of the Branch County Health Department in Michigan, previous to which time he was in Northern California.

LT. COL. ALBERT S. MCCOWN, M.C., A.U.S.,* has been named Surgeon of the Port Dispensary, San Francisco Port of Embarkation and Port Industrial Medical Officer, with headquarters at Fort Mason, Calif. Colonel McCown has served recently with Supreme Headquarters, A.E.F. in the G-5 and Mission to France organizations.

NICOLAI N. RILCOFF, M.D., formerly Venereal Disease Control Officer with the Kern County Health Department, California, has been appointed Health Officer of the County, succeeding DR. JOHN K. COKER, JR.,† Bakersfield, effective April 1.

Canada

THE HONORABLE R. PERCY VIVIAN,† Minister of Health and Public Welfare of Ontario, has been appointed to the chair of Health and Social Medicine at McGill University. No date has been announced for the assumption of his new duties pending the completion of projects in which he is now engaged as Minister of Health.

Foreign

RODOLFO MASCARENHAS, M.D.,† São Paulo, Brazil, Assistant to the Director of the State Health Department, has been studying public health administration in the United States as a guest of the State Department.

SIR JOHN BOYD ORR † has retired from the Directorship of the Rowett Research Institute at Aberdeen, Scotland, and was elected a member of Parliament representing the Scottish Universities. His vote is said to have represented the largest majority ever given to a candidate. Sir John hopes to revisit the United States after the war.

NORMAN C. PARFIT, M.D.,† has returned to Oxford, England, after spending some years as Associate Professor of Public Health in the West China Union University School of Medicine, Chengtu, China.

ELIZABETH REED, R.N., who for two years has served as consultant nurse with the Office of the Coordinator of Inter-American Affairs in Brazil, has returned to the United States and has been appointed Director of the Visiting Nurse Association in Jacksonville, Fla.

Death

ALBERT WALTON ROTH, M.D., a founder and President of the Tulsa Public Health Association, Oklahoma, died March 17, aged 71.

* Fellow A.P.H.A.
† Member A.P.H.A.